# OTAY CROSSINGS COMMERCE PARK

APPENDIX M

FIRE PROTECTION PLAN

to the

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT

EIR 93-19-006Q, TM 5405RPL<sup>7</sup> SCH No. 2006041039

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May 2010

# FIRE PROTECTION PLAN FOR

# **OTAY CROSSINGS COMMERCE PARK**

## TM 5405RPL7

### **PREPARED FOR:**

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May 2010

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#### 1.0 INTRODUCTION

The proposed project involves a Tentative Map (TM) and Preliminary Grading Plan (Tract 5405RPL7) for a 311.5-acre property in the East Otay Mesa area, as well as off-site roadways and sewer improvements to support the project site development. The project is proposing fifty-nine lots divided into 5 units (Figure 1 – Map Pocket).

### 1.1 Purpose of the Fire Protection Plan

The purpose of this Fire Protection Plan (FPP) is to meet the requirements of the Rural Fire Protection District and County of San Diego regarding fire safety in the Wildland/Urban Interface for the Otay Crossings Commerce Park Development, TM 5405. Article 86 of the 2001 edition of the California Fire Code (WFCA and CBSC 2001) indicates that a Fire Protection Plan shall be required for all new development within the Wildland/Urban Interface.

The exact uses on each lot have not been identified at this time. For technical analysis purposes, it is assumed that technology business park uses and/or industrial uses would be developed. Future development of industrial lots would require processing of site plans by each lot owner or lessee; no design details are currently proposed, but all lots would be developed with Mixed Industrial uses, in conformance with County ordinances, regulations and the East Otay Mesa Specific Plan (EOMSP) Site Planning and Design Guidelines (County of San Diego 1994), including obtaining the relevant permits required for any interim uses. In addition, all future industrial site plans would undergo design review by County staff and in accordance with the "B" Designator.

This conceptual plan provides some of the potential requirements which would be imposed when each lot is developed, and to recommend standards that should be followed when detailed design is performed for each lot. The actual requirements of the Fire District and DPLU Fire Marshal may vary from the recommendations in this conceptual plan when detailed plans for development are submitted. Detailed site plans for each lot shall reference and include the recommendations and standards in this plan as modified to address the actual proposed development. All detailed site plans shall comply with the current requirements of the District and County Fire and Building Codes at the time they are submitted.

### 1.2 Project Location

The proposed Otay Crossings Commerce Park project (hereinafter referred to as the proposed project) is located in the unincorporated community of East Otay Mesa within the Otay Subregional Planning Area in the southernmost portion of San Diego County, approximately two miles east of the proposed State Route (SR)-125/SR-905 interchange (Figure 2). The project site is located within the southern section of Subarea 2 of the EOMSP area, southeast of the intersection of Old Otay Mesa and Alta roads. The site

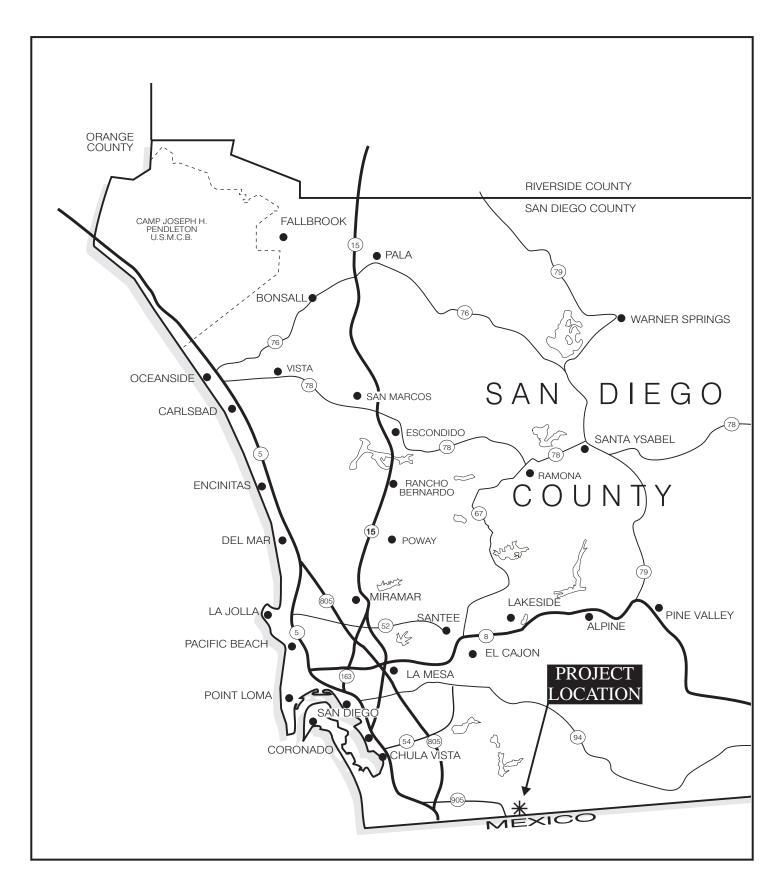




Figure 2
Regional Location Map

extends southeast from the intersection to the United States (U.S.)-Mexico International Border.

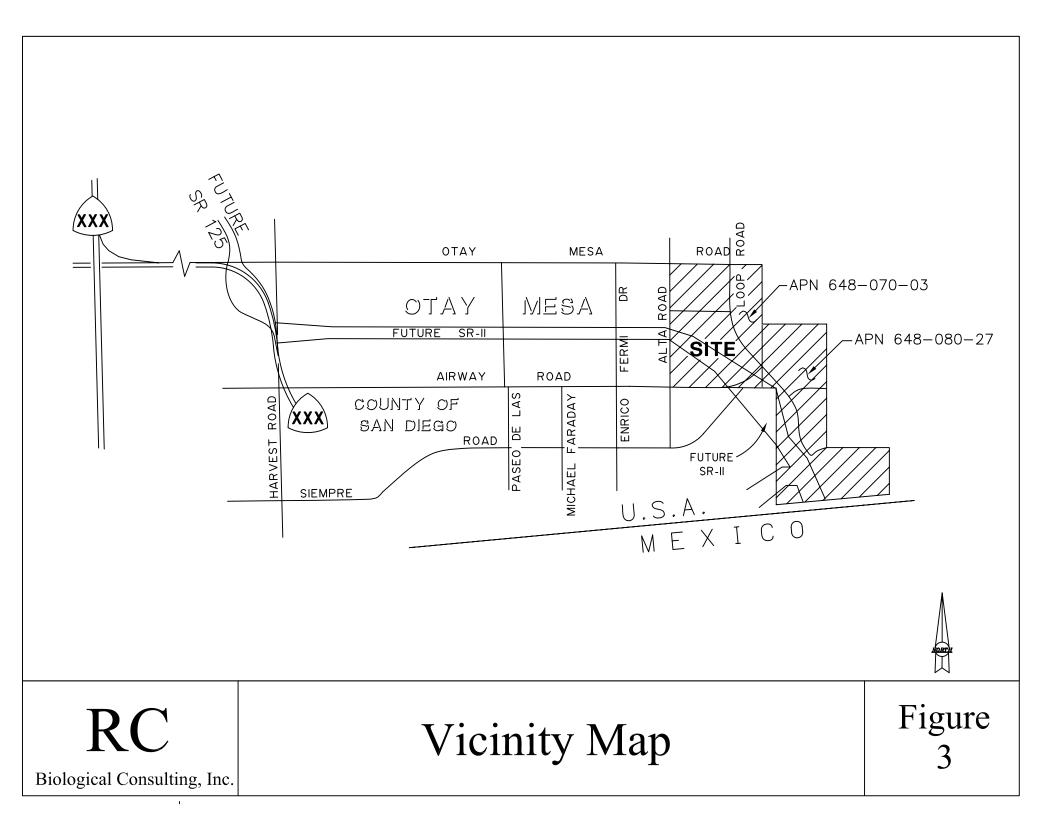
The northwest portion of the irregularly shaped project site is bordered on the north by Old Otay Mesa Road, on the west by Alta Road, and on the south by a currently unpaved extension of Airway Road. Approximately half of the northwestern portion of the site extends to about 600 feet east of Camino Del Mayer (formerly Loop Road), while the other half extends an additional 1,300 feet east of Camino Del Mayer. The southern portion of the project site extends as far south as the U.S.-Mexico International Border, and approximately one mile east of Alta Road. Figure 3 is a Project Vicinity Map, while Figure 4 presents an aerial view of the project site and vicinity.

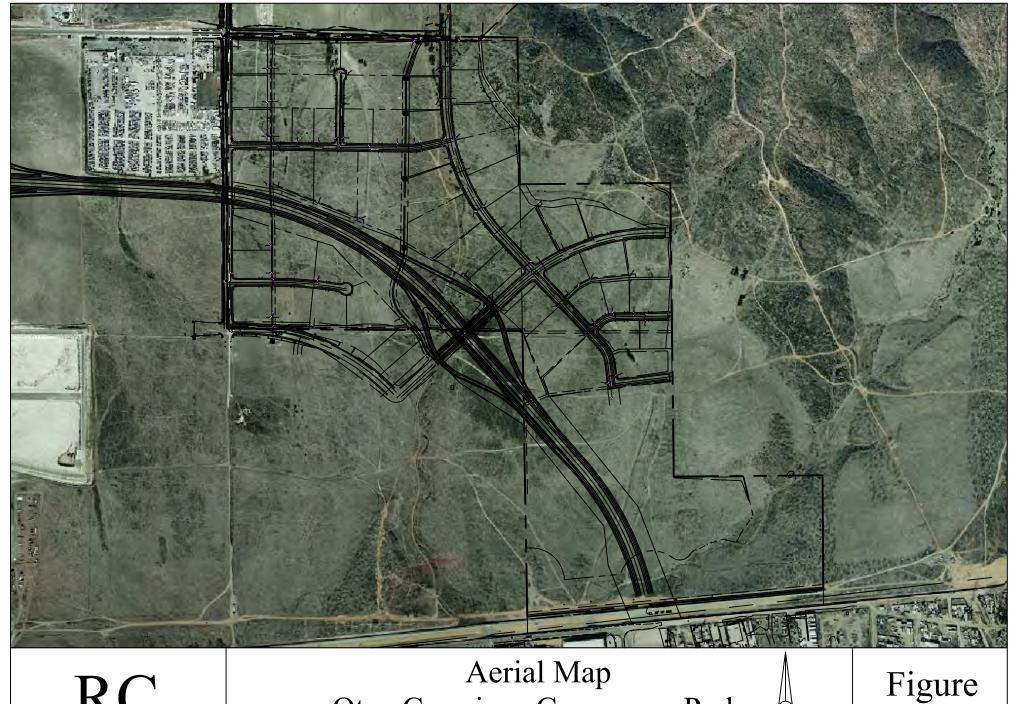
The proposed project is located with an area of undeveloped lands intermixed with development. As a result the project is located within the Wildland-Urban Interface (WUI).

#### 1.3 Land Uses

The proposed subdivision and industrial use of the project site is planned to be consistent with the land use plan for Subarea 2 of the EOMSP, which identifies the entire site for Mixed Industrial use, except a small area (4.36 acres) of the northeast corner of the site, which is designated for Rural Residential use. The proposed project would subdivide the 311.5-acre property into 56 industrial lots and three open space lots ranging in size from 0.9 net acre to 59.1 net acres. About three quarters of the lots would be less than 4 acres in size, and all but two lots would have an area of less than 9 acres. The two largest lots (Lots 56 and 57, with 59.1 acres and 36.3 acres, respectively) at the south end of the site is where the future U.S. POE could be developed. The 59 lots would be divided and recorded in five separate units (see Tentative Map – Map Pocket). Approximately 285.5 acres would be placed in lots (including FHWA/Caltrans/GSA ROW), while 20.4 acres would contain internal on-site public streets, and the construction of half-widths up to the center lines of Otay Mesa Road, Alta Road and Airway Road immediately adjacent to the site would occupy 5.6 acres.

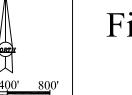
Of the area placed in lots, 46.0 acres would be contained in open space easements (across eight lots in the three northeast corners of the project site and along its southern boundary by placing them in separate open space lots [Lots 57, 58 and 59])). Although the ultimate route and POE location are still being determined by FHWA/Caltrans/GSA, the preliminary ROW for SR-11 and the potential location for the POE has been mapped on three of the 59 proposed lots, covering approximately 120.0 acres of the site (see Figure 1). The area encumbered by the future ROW for SR-11 and the POE (i.e., Lots 54, 55 and 56) would be reserved pursuant to Government Code Section 66480. The timing of SR-11 and POE ROW selection and construction is dependant on FHWA/Caltrans' and GSA's development schedules. Interim use of the SR-11 and POE ROWs could be permitted, but no permanent buildings would be allowed. For technical analysis purposes, it is assumed that truck parking could take place as an interim use of the SR-11 ROW and federal POE ROW, however, no permit application to allow such a use has





RC
Biological Consulting, Inc.

Aerial Map
Otay Crossings Commerce Park
TM 5405



been included with the current permit applications. Table 1 presents a summary of acreages of proposed lot areas and on-site public road improvements. A more detailed description of the proposed roadways is provided in Section 6.1, Access.

	TABLE 1* FAY CROSSINGS COMM						
AND ROAD IMPROVEMENTS Unit Lot Number Acres							
		2.3					
1	1						
<u> </u>	3	2.2					
<u> </u>	4	1.6					
1	5	1.4					
1	6	1.4					
<u> </u>	7	4.3					
1	8	4.6					
1	9	4.7					
1	10	4.7					
<u> </u>	11	1.9					
<u> </u>	12	2.3					
1	42	7.5					
1	42	5.0					
<u> </u>	43						
		3.6					
1 Subto	45	2.5					
2 Subto	otal Unit 1	51.6					
2	13	2.0					
2	15	1.9					
2	16	1.6 1.9					
2	17	2.5					
2	18	3.4					
2	19	3.6					
2	20	3.0					
2	21	2.5					
2	22	2.8					
2	23	3.3					
2	24	2.8					
2	37	2.9					
2	38	3.7					
2	39	4.9					
2	40	3.7					
2	41	1.6					
2	58	6.7					
2	59	4.1					
Subto	otal Unit 2	58.9					

ACREAGE OF OT	TABLE 1* AY CROSSINGS COM	MERCE PARK LOT
	D ROAD IMPROVEME	
3	46	2.1
3	47	2.0
3		
3	49	3.0
3	50	2.6
3	51	3.6
Unit	Lot Number	Acres
3	52	2.4
3	53	3.7
3	54 <sup>1</sup>	23.71
Subtot	al Unit 3	45.8
4	25	3.3
4	26	2.7
4	27	2.2
4	28	2.1
4	29	1.6
4	30	2.8
4	31	1.7
4	1.9	
4 32 4 33		2.9
4	34	4.6
4	35	4.0
4	36	3.1
4	55 <sup>1</sup>	$0.9^{1}$
Subtot	al Unit 4	33.8
5	56 <sup>2</sup>	59.1 <sup>2</sup>
	57	36.3
Subtot	al Unit 5	95.4
Total 1	Lot Area	285.5
On-Si	20.4	
	dering site: Otay Mesa	
	and Airway Road) <sup>3</sup>	
Otay Mes	2.3	
Alta R	2.9	
Airway	0.4	
TOTAL ON-SITI	E PROJECT AREA	311.5
Off-Site In	nprovements	31.1

<sup>\*</sup>Table from Helix Environmental Planning, Inc. (HELIX)

<sup>&</sup>lt;sup>1</sup> Set aside for Caltrans ROW for SR-11<sup>2</sup> Set aside for Caltrans ROW for SR-11 and GSA ROW for Otay Mesa East POE.

<sup>3</sup> The adjacent Otay Mesa Road widening easement

Building pads would generally be sited on the level and gently sloping portions of the property. The steep slopes and sensitive hillsides on site would be included within the 46.0-acre open space easement. The proposed project would entail the phased grading of approximately 265 acres of the property (refer to Figure 1). Grading Phase 1 (approximately 168.4 acres, covering units 1, 2 and 3 and excluding open space easements) would be expected to begin in early 2010. Grading Phase 2 (approximately 97.2 acres, covering Units 4 and 5 and excluding open space easements) would be expected to take place in mid-2012. There is the possibility that both grading phases could occur simultaneously. Off-site grading is proposed as part of both grading phases within the public ROW for Otay Mesa Road, Alta Road, Airway Road and Siempre Viva Road and to install off-site storm drain outlet structures south of Airway Road and Siempre Viva Road (refer to Figure 1). Adjacent property owners would implement additional grading as development occurs in the area and future roadway improvements and storm drains are implemented. No deviations from the County Grading Ordinance are requested.

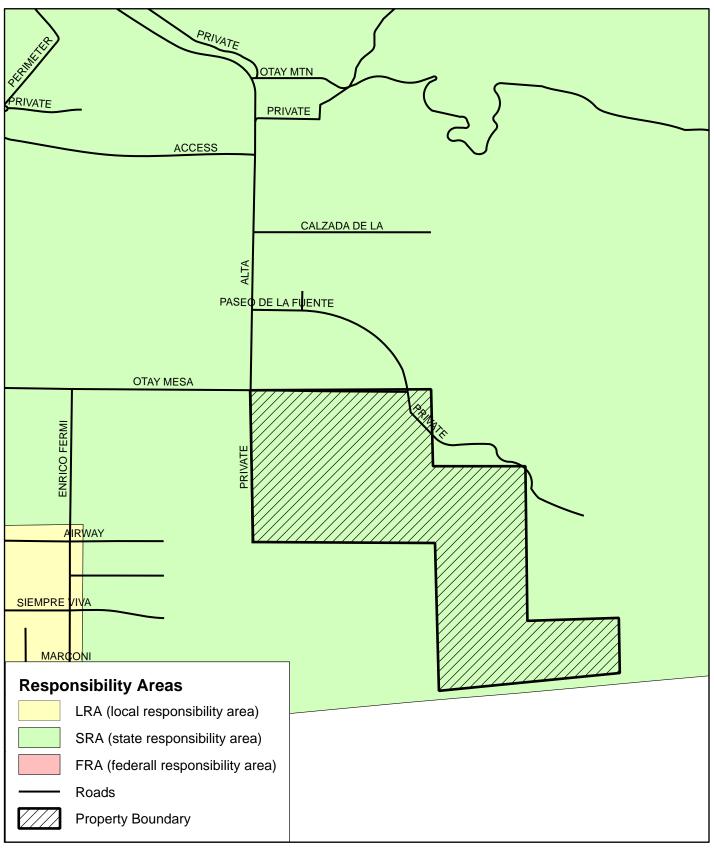
Future development of industrial lots would require processing of a site plan for each lot; no design details are currently proposed, but all lots would be developed with industrial uses, in conformance with County ordinances, regulations and the EOMSP Site Planning and Design Guidelines (County of San Diego 1994b), including obtaining the relevant permits required for any interim uses. All future industrial site plans and major use permit applications for potential interim uses would undergo review by County staff.

#### 1.4 Open Space Easements

Conservation easements are proposed over land within the "G" Designator Area of the Specific Plan to protect slopes and biological resources. The steeper slopes on-site would be located in three open space lots with open space easements primarily in the in the northeastern corners of the site and along its southern boundary (i.e., Lots 57,58, and 59). In addition open space easements will occur on a portion of Lots 16-24. The open space easements would also serve to protect sensitive habitats, including Diegan coastal sage scrub and non-native grassland. Refer to Figure 1 for the location of the proposed open space easements on-site.

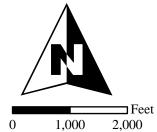
#### 2.0 SETTING AND FIRE HISTORY

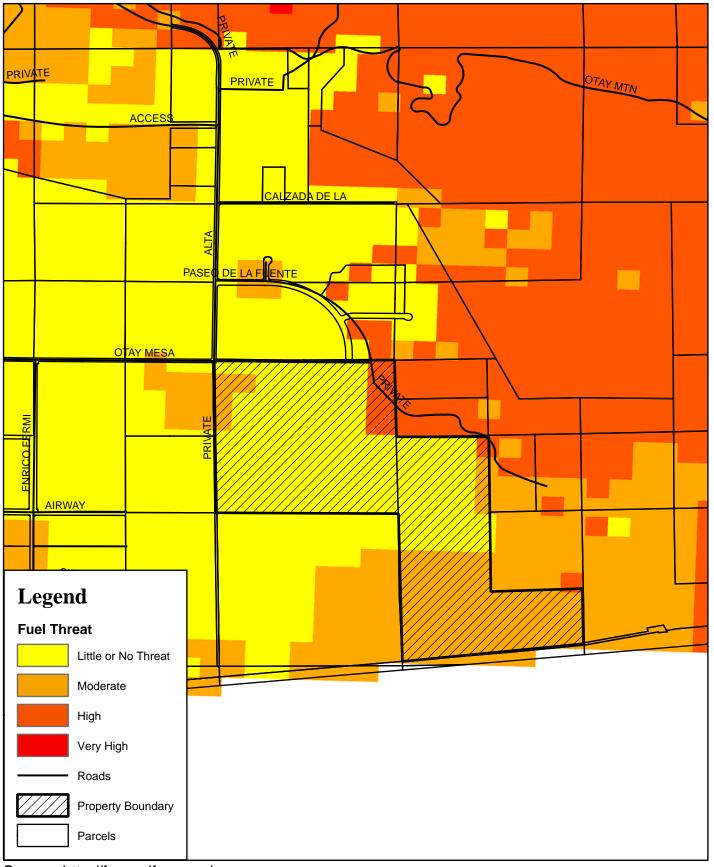
Structural and wildland fire protection is provided to the project area by the Rural Fire Protection District. The project is located within a State Responsibility Area (Figure 5 The project site is located in an area of low to highly flammable vegetation as depicted by the California Department of Forestry Fuel Threat map (Figure 6). The following sections discuss the surrounding land use, topography, vegetation, climate, and fire history.



Source: http://frap.cdf.ca.gov/

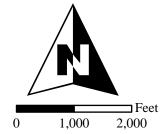
Figure 5
Responsibility Area Map
Otay Crossings Commerce Park Property





Source: http://frap.cdf.ca.gov/

Figure 6
Fire Threat Map
Otay Crossings Commerce Park Property



# 2.1 Surrounding Land Use and Topography

The project site is surrounded by undeveloped lands, primarily former pasture lands, and commercial/industrial (Figure 4). Otay Mountain is northeast of the project site and Otay River is to the northwest (Figure 7). The proposed development area spans the project site with a limited amount of open space in the northeastern corners and southeastern corner. The site is gently sloping with the lower elevations to the southwest and the higher elevations in the north. The project site is in the lower elevations of a hill to the northeast (Figure 7). The project contains an east-west drainage along the southern portion of the proposed open space area. Once the site is graded for development the grade on the developable portion of the lots be will less than 4 percent as illustrated on the Tentative Map (Figure 1).

## 2.2 Vegetation

Plant communities on and off-site were mapped by Helix Environmental Planning, Inc. (Helix) and are included as Figure 8. Two plant communities within the on-site open space and adjacent to the project site were considered for fuel load including: Diegan coastal sage scrub and non-native grassland. The fuel loading for non-native grassland is considered a conservative representative of the agriculture and disturbed habitat adjacent to the site. Developed land also occurs adjacent to the project site. The proposed open space is composed primarily of coastal sage scrub and some non-native grassland within the drainage feature in the southern portion of the project site. An area of approximately 150 feet in width occurs adjacent to the southern property line and the International Border with Mexico. This area is composed non-native grassland, developed and disturbed lands. Immediately south of the Internal Border the property is developed (Figures 4 & 8).

Figure 9 illustrates the coastal sage scrub habitat proposed to be preserved within the onsite open space. Figure 10 represents the non-native grassland on and adjacent to the site.

### 2.3 Climate

As defined by the National Weather Service, San Diego has four climate zones: coastal, inland, mountain, and desert climate. These climate zones are determined by several factors: proximity to the ocean, terrain, elevation, and latitude. Using the Koppen system, the metropolitan areas of Southern California have a Mediterranean climate, characterized by mild, sometimes wet winters and warm, very dry summers. The Mediterranean climate includes all coastal areas, valleys and foothills. Annual precipitation amounts increase gradually from the coast to the mountain crests, then drop dramatically into the deserts. Most precipitation comes from winter storms between November and March. The site is located within the inland climate zone. Average rainfall is 10 to 15 inches per year (Western Regional Climate Center).

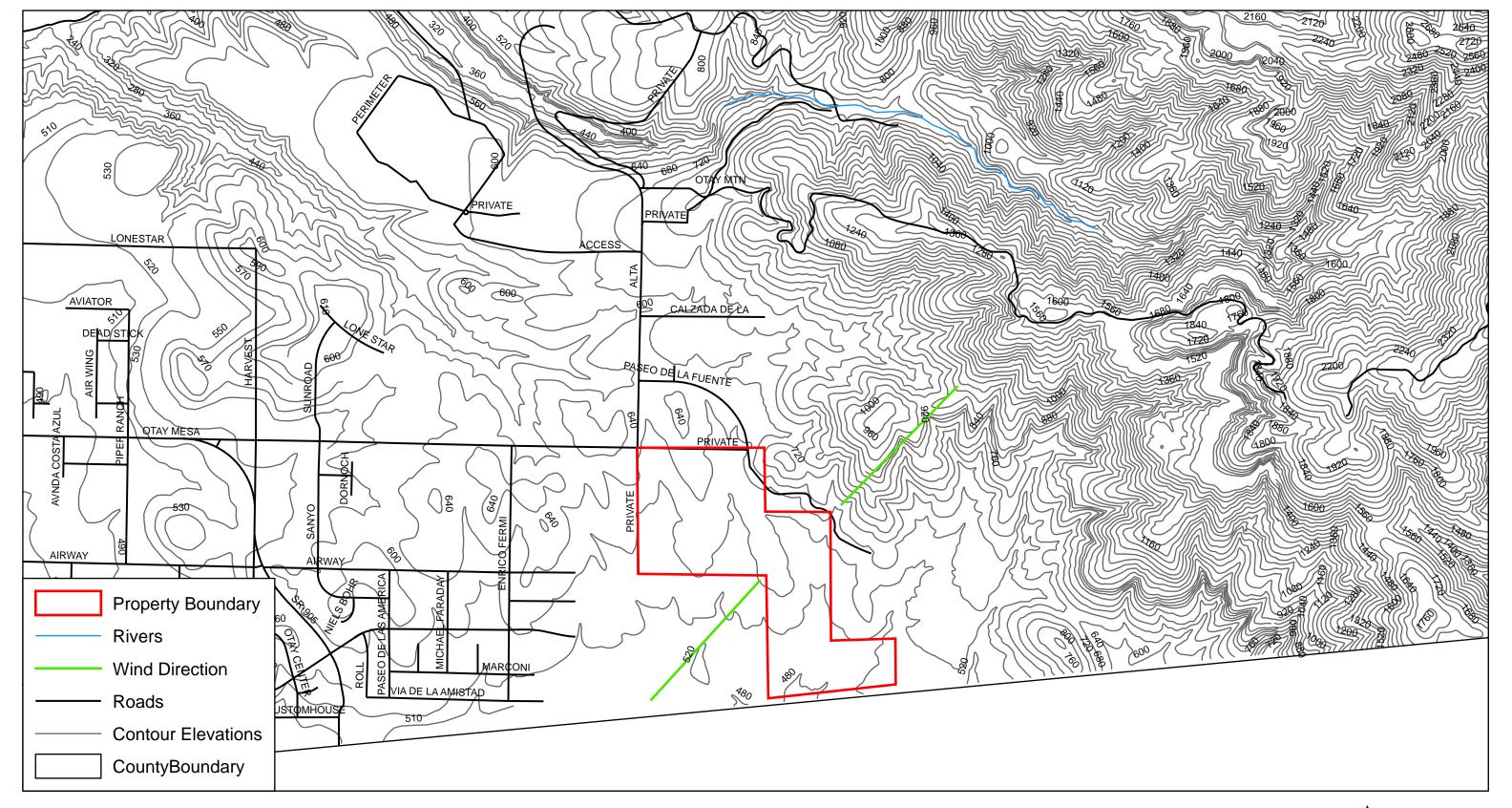
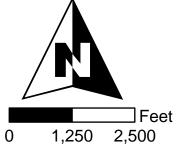
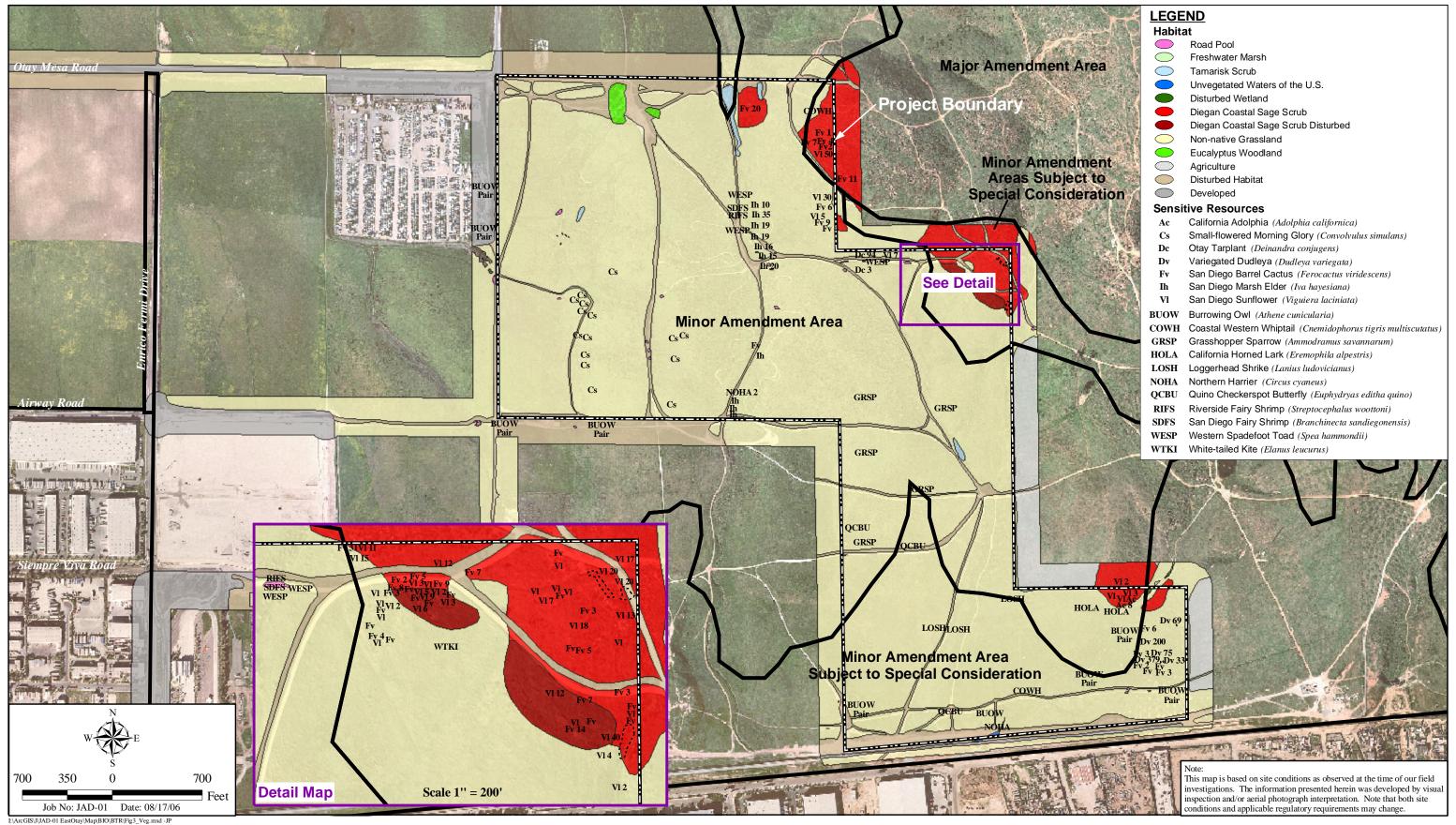


Figure 7 Contour Map







OTAY CROSSINGS COMMERCE PARK





Figure 9. Coastal Sage Scrub within Proposed Open Space



Figure 10. Non-Native Grassland

# 2.4 Fire History

The fire history of the site and surrounding area (approximately 2.5 mile radius) was reviewed (Figure 11). The source of the fire history information is the California Department of Forestry Fire and Resource Assessment Data from 2005. The data include

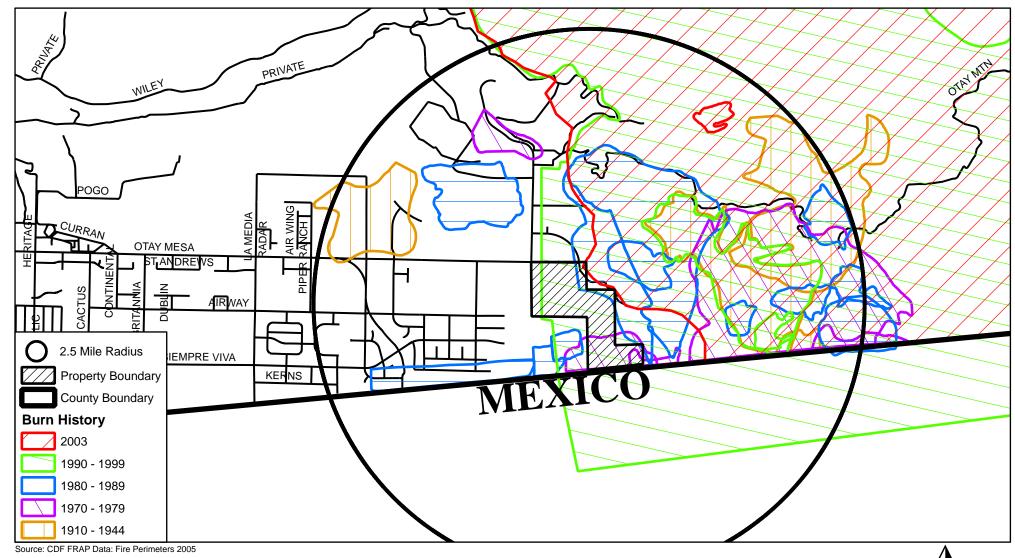


Figure 11 **Burn History** 



2,000 4,000

most large fires since 1910 however smaller fires may not be mapped. The data indicate that the site or portions of the site burned in 1978, 1979, 1982 and 1996. The Mine/Otay fire of 2003 which started the day after the Cedar fire burned to the eastern property line and possibly a small distance on-site. Approximately 40 fires burned on-site and the surrounding are between 1910 and 2003 as identified in Table 2, below. For those fires with known dates of origin all of them except one occurred during the summer and fall months of June through November. There is a noticeable lack of fire activity documented between 1944 and 1970.

Table 2 Burn History of the Site and Vicinity (2.5 mile Radius)						
Name Year Month Day Acres Cause Agency						
	1910	0	0	846	Unknown/Unidentified	USF
	1910	0	0	1988	Unknown/Unidentified	USF
	1912	0	0	38	Unknown/Unidentified	USF
	1919	0	0	27920	Unknown/Unidentified	USF
	1944	0	0	340	Unknown/Unidentified	USF
	1971	0	0	90	Unknown/Unidentified	USF
OTAY	1978	7	8	600	Unknown/Unidentified	CDF
	1978	0	0	22	Unknown/Unidentified	USF
COTTENWOOD	1979	6	29	785	Unknown/Unidentified	CDF
OTAY #5	1979	6	10	1299	Unknown/Unidentified	CDF
	1979	0	0	72	Unknown/Unidentified	USF
	1979	0	0	132	Miscellaneous	USF
	1979	0	0	211	Miscellaneous	USF
OTAY #12	1980	8	31	168	Miscellaneous	USF
OTAY #4	1980	7	18	265	Miscellaneous	USF
OTAY #6	1980	7	19	2462	Unknown/Unidentified	CDF
OTAY #8	1980	8	17	112	Unknown/Unidentified	USF
POND	1980	6	11	21	Unknown/Unidentified	CDF
DULZURA	1982	10	23	4950	Debris	CDF
OTAY #7	1982	8	18	65	Unknown/Unidentified	CDF
OTAY #8	1982	9	1	99	Arson	CDF
OTAY #9	1982	10	11	800	Equipment Use	CDF
OUTSIDE						
ORIGIN #6	1982	11	9	330	Unknown/Unidentified	USF
CEDAR	1983	9	10	292	Smoking	CDF
MARRON	1983	8	6	374	Unknown/Unidentified	CDF
OTAY #1	1983	7	2	39	Miscellaneous	USF
OTAY #12	1985	8	25	188	Unknown/Unidentified	USF
MINE	1986	9	4	965	Arson	CDF
OTAY #10	1986	8	9	69	Unknown/Unidentified	USF
OTAY #10	1988	7	14	39	Miscellaneous	USF
OTAY #14	1988	8	7	73	Miscellaneous	USF
OTAY #3 (#4)	1988	5	30	35	Miscellaneous	USF

Table 2 Burn History of the Site and Vicinity (2.5 mile Radius)						
Name						
OTAY	1993	6	18	641	Unknown/Unidentified	CDF
TECATE #44	1993	10	26	137	Arson	CDF
OTAY #269	1996	7	31	575	Campfire	CDF
OTAY #322	1996	10	22	16561	Campfire	CDF
BORDER #58	1999	6	21	44	Equipment Use	CDF
BORDER#2	2003	8	13	112	Campfire	CDF
BORDER#5	2003	8	17	37	Campfire	CDF
MINE/OTAY	2003	10	26	44734	Miscellaneous	BLM

### 3.0 RISK ASSESSMENT – WILDLAND FIRE

The area has a history of burning from wildland fires as discussed in Section 2.4 – Fire History. The site is proposed to be developed in five units or in two grading phases. Each unit will be mass graded with other adjacent units and the site seeded for erosion control in conformance with the Conceptual Landscape Plan discussed in Section 3.2.2. The remaining on-site vegetation threat would primarily be from non-native grassland. This is also the primary type of fuel posing a threat from off-site. In addition a small amount of coastal sage scrub is proposed to be preserved within open space. With the implementation of proper vegetation management threat from a wildland fire is less significant than the threat posed by a structure fire.

### 3.1 Fuel Modeling

Fire modeling was performed using Behave Plus 3.0.1 for two types of weather conditions, a Santa Ana condition (Fall), and a normal weather condition (Summer). RAWS (Remote Automated Weather Station) data was not available. Weather data are from the Western Regional Climate Center (WRCC) for the Chula Vista Station. Due to the fact that the project site is approximately 13 miles from the coast and would not have as much of a coastal influence as reflected in the data for the Chula Vista station, ten degrees were added to the average maximum temperature. Since the data from WRCC lack wind information, wind information was gathered by reviewing historical data for Brown's Field which is approximately a mile to the west. The data from www.weatherunderground.com does not represent official National Weather Service data however is still useful these data also support the use of the selected temperature inputs. Weather data are included in Appendix A.

The results of the modeling are summarized here and included in Appendix B. Due to the fact that the site is located in area that is relatively flat and that the project once graded will not have a slope of greater than 3.5 percent. A 5 percent slope was used for the non-native grassland (Fuel Model 3). Southern California fuel model SCAL 18 (sage/buckwheat) was used to represent the coastal sage scrub within the open space on the east of the property on and off-site. The coastal sage scrub is associated with steep

slopes however the proposed development is at the foot of the slope so a slope of 0 percent was used. The modeling for coastal sage scrub primarily applies to lots 16 to 24.

#### 3.1.1 Santa Ana Condition

A Santa Ana weather condition is the worst weather for fire. Santa Ana's typically occur from September to May. The fall Santa Ana can create extremely dangerous fire conditions because they are associated with high temperatures, high winds coming from the north/northeast and low humidity. They also occur after long periods of no rain when the vegetation is in a drought stress condition. The soft shrubs that compose habitats such as coastal sage scrub are semi-drought deciduous and have typically lost the majority of their foliage by the end of summer. The hard woody shrubs that compose chaparral habitat are dormant during this period and have little active growth which results in low fuel moisture.

#### Fire Behavior

Santa Ana winds result in a wind driven fire. These winds typically come from the northeast. Santa Ana winds are Foehn winds which are warm dry winds that result from air spilling over high elevations and moving downhill. These are gravity winds that typically follow the ground. When gravity winds hit an obstacle they can either split around the obstacle and continue or follow the object to the top and then launch over the top resulting an area behind the obstacle with normal wind conditions. This site is sheltered by a ridgeline approximately 7000 feet to the northeast that runs approximately northeast/southwest (Figure 7). In addition, the development would be downhill from a fire coming from the northeast which would slow that rate of spread. These factors would reduce the potential for ignition from the flame front however there is still the possibility of spotting from brands.

#### Fire Modeling

The modeling parameters were chosen based on historic weather data for the Chula Vista station. Due to the distance from the coast as compared to the weather station 10 degrees was added to the average maximum temperature for the months of September through October resulting in a temperature input of 82 degrees Fahrenheit. Wind information was gathered by reviewing historical data for Brown's Field which is approximately a mile to the west. The monthly summary for October 1996 was selected due to the occurrence of the Otay 322 fire and several other October fires occurring as documented in the burn history of the site. The maximum wind of 20 mph hour was used.

Modeling used a 20 mile per hour wind, coming from 45 degrees from the north, and a temperature of 82 degrees Fahrenheit. The dead fuel moisture used was 2 percent, and the live fuel moisture was 50 percent. This represents a very low moisture scenario which would be most applicable to the time of year Santa Ana's typically occur. Slope for the non-native grassland model was 5 and for the coastal sage scrub 0 percent. Table 3 summarizes the results.

Table 3						
Results for a Santa Ana Fire						
Non-native Grasslands Coastal Sage Scrub*						
Flame Length	24.5 feet	29 feet				
Rate of Spread 4.1 mph 1.3 mph						
<b>Spotting Distance</b>	0.9 miles	1 mile				

<sup>\*</sup> Affects lots 16-24

#### 3.1.2 Normal Conditions

Normal weather conditions consist of an onshore flow from the southwest. This condition has a lower temperature and higher humidity then does a Santa Ana condition.

#### Fire Behavior

A fire under normal conditions is typically a fuel driven fire however wind will also contribute to the rate of spread. A fire coming from the southwest would be burning uphill and as a result would get a run on the project site. However the property to the southwest is composed of non-native grasslands which are a lower fuel threat then are shrub communities.

### Fire Modeling

The modeling parameters were chosen based on historic weather data for the Chula Vista station. Due to the distance from the coast as compared to the weather station, ten degrees was added to the average maximum temperature for the months of June through August resulting in a temperature input of 82 degrees Fahrenheit. Wind information was gathered by reviewing historical data for Brown's Field which is approximately one mile to the west for the month of July 2005.

Modeling for all of the lots used a 14 mile per hour wind, coming from 225 degrees from the north and a temperature of 82 degrees Fahrenheit. The dead fuel moisture used was 3 percent, and the live fuel moisture was 50 percent. This represents a moisture scenario which would be most applicable to normal weather conditions. Slope for the non-native grassland model was 5 percent and for the coastal sage scrub 0 percent. Table 4 summarizes the results.

Table 4						
Results for a Summer Fire						
Non-native Grasslands Coastal Sage Scrub*						
Flame Length	18.0 feet	23.4 feet				
<b>Rate of Spread</b> 2.3 mph 0.9 mph						
<b>Spotting Distance</b>	0.5 mile	0.7 miles				

<sup>\*</sup> Affects lots 16-24

# 3.2 Fuel Management

The project will have to provide fuel management for the project as a whole and for the individual lots as they develop. A conceptual landscape plan for the project has been prepared as required. The landscape plan focuses primarily on the required screening, street trees, and erosion control. The developer only has limited control over the required planting density and future maintenance of the areas within the public right of way. Actual fuel management zones and requirements will have to be determined as part of the site plan review for each lot. This plan provides only a conceptual plan for zones of fuel management.

As can be seen from the modeling, the greatest anticipated flame length is from the coastal sage scrub within the proposed open space burning during a Santa Ana fire. The resulting flame length is 29 feet. The remaining flame lengths are under 25 feet. The model is an estimate of the flame lengths that can be anticipated. Actual fire behavior can be more or less intensive.

#### **3.2.1** Limited Building Zone Easement

The project shall record a limited building zone easement of 100 feet adjacent to any proposed open space. The purpose of this easement is to ensure that structures requiring fuel management will not be placed close enough to the proposed open space to result in fuel management occurring in the open space. This also ensures that a minimum of 100 feet of fuel management can be performed between proposed structures and the open space limits. As currently designed the limited building zone easement shall be recorded on Lots 16- 24, and 56.

#### 3.2.2 Conceptual Landscape Plan

The Conceptual Landscape Master Plan for Otay Crossings Commerce Park proposed as part of the project design is depicted in Figure 12 (Map Pocket). This plan is proposed to be consistent with the County's Landscape Water Conservation Design Manual, the County's Grading Ordinance, the EOMSP Subarea 2 Specific Plan, and the East Otay Mesa Subarea 2 Site Planning and Design Guidelines.

All graded slopes three or more feet in vertical height, including slopes associated with detention basins, would be landscaped to prevent erosion of soils. Steeper graded slopes (over 15 feet in height) would be planted with 100 percent ground cover and one shrub or tree per 100 square feet (s.f.) of slope surface. Planting adjacent to open space easements would be limited to non-invasive native species, while proposed grass and rock drainage channels would be planted with non-invasive native grasses. Hydro-seeding would be applied to all graded and un-graded slopes and all building pad areas not scheduled for improvements within six months of completion of rough grading. Landscaped areas would be irrigated with automatic irrigation systems, with individual property owners and the business park association responsible for the long-term maintenance of the

landscaping, including public ROW. Non-irrigated areas (hydroseeded pads and non-graded areas) will depend on natural rainfall for germination.

The proposed project shall provide fuel modification on either side of public roadways, pursuant to Sec. 4707.2.1 of the Consolidated Fire Code. A property owner adjacent to a public or private road or driveway constructed after the effective date of this chapter shall modify combustible vegetation in the area within 30 feet from each side of the road or driveway to establish a fuel modification zone.

#### **3.2.3** Zones

The Consolidated Fire Code requires management of flammable vegetation within 100 feet of structures. The management can be divided into zones with the first 50 feet having the most restrictions with regard to type of plants allowed, location and density and requirements for maintenance. The remaining 50 feet are less restrictive and in some instances will not be necessary as a result of a maintained or developed land use within the 50 feet. The following fuel management zones are conceptual due to the fact that the actual fuel management zones will have to be identified as a part of the site plan review for the development of each lot. These zones should also be revisited at the time of site plan review to determine if the requirements are still appropriate based on the current level of development within the overall project. Figure 13 illustrates the conceptual placement of the zones on an individual lot including the requirement for the 100 foot Limited Building Zone adjacent to Biological Open Space.

#### **Zone A – 50 foot Minimum Next to Structures**

Zone A includes areas within 50 feet of structures and 30 feet adjacent to roads. Exact fuel management requirements along roads on individual lots will vary in width as a result of the size of the proposed roads and will be determined at the time of site plan review. This zone may contain items such as parking and roads. Fuel management within this zone shall consist of landscape plantings that are maintained and irrigated so that they will not create fire hazards near structures. The following measures will reduce fire hazards near buildings:

- Highly flammable plants adjacent to structures are prohibited.
- Except for prostrate varieties, acacias, cedars, cypress, eucalyptus, juniper, pines, rosemary and California pepper shall not be planted.
- Plants will only be selected from the County of San Diego "Acceptable Plants for a Defensible Space in Fire Prone Areas" included as Appendix C or other as approved by the Fire Marshal.
- No plants on the undesirable list included in Appendix D shall be planted.



Figure 13 -Conceptual Fuel Management Zones

- No Plants on the included on List A and B of the California Exotic Pest Plant Council's list of "Exotic Pest Plants of Greatest Ecological Concern in California as of October 1999" (or more recent version) (Appendix E) shall be planted.
- Trees shall not be planted closer to structures then the distance equal to the tree's mature canopy plus 10 feet. Tree canopies shall be separated by 20 feet.

# <u>Irrigation</u>

Permanent irrigation shall be provided to ornamental plantings. Irrigation will conform to any applicable County Landscape Requirements.

#### Maintenance

Maintenance within this zone shall be performed year-round and include the following tasks:

- Prune and thin trees (Figures 14 and 15) around structures to decrease fuel volume, retain succulent growth and to provide adequate clearance between structures and plants.
- Tree branches overhanging roofs shall be removed.
- Trash and combustible debris shall be cleared from around structures, and removed from roofs and rain gutters.
- Irrigation systems will be maintained to ensure that they function properly and plantings are watered sufficiently to maintain succulent growth.

### Thinning and Pruning

Figure 14 below illustrates how native trees retained and planted trees shall have a minimum canopy separation of 20 feet.

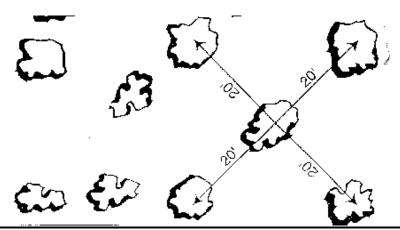


Figure 14. Thinned Trees

Pruning will further reduce the fuel load. Pruning shall be accomplished in the following manner:

 Individual trees and shrubs will be pruned to remove dead, dying and excessively twiggy growth. Figure 15 below illustrates the desired result of pruning.



Figure 15. Pruning of Landscape Shrubs and Retained Trees

• Trees and larger tree form shrubs shall be pruned to provide clearance of three times the height of the understory plant material or six feet whichever is higher. Figure 16 below illustrates this requirement.

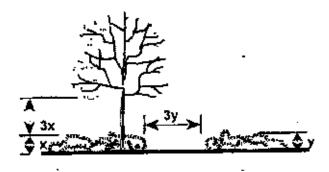


Figure 16. Pruning and Spacing of Trees and Shrubs

### **Zone B – 50 feet (Where Applicable)**

Zone B is the remaining 50 feet of fuel management adjacent to flammable vegetation. Roads and other "non-structure" improvements are allowed in this zone. Zone B can either be cleared in conformance with Zone A above, or selectively cleared and modified as described below. No noxious weed species will be planted within this zone due to the adjacency of the open space. For the purposes of this plan noxious weed species shall be those included on the list of Undesirable Plants and Weeds and Lists A and B of the California Exotic Pest Plant Council's list of "Exotic Pest Plants of Greatest Ecological Concern in California as of October 1999" (or more recent version), Appendix D and E respectively.

### **Fuel Modification**

If fuel modification is implemented to reduce fuel load then the following should sufficiently reduce fuel load to increase the fire safety of the overall parcels. Native plant species shall be selectively thinned by 50 percent and pruned by 40 percent to provide fuel discontinuity and a reduction in the fuel load. Figure 17, below illustrates the desired result of the thinning within this zone.

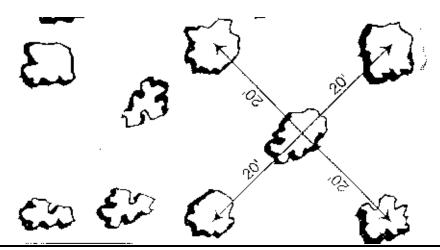


Figure 17. Natural Vegetation thinned by 50 percent.

#### Thinning

Thinning maybe accomplished in the following manner:

- Retaining shrubs species in suitable densities will result in reducing erosion as a result of brush management due to their deep root systems. Pruning of the plants retained will reduce the fuel load.
- Plant species to be removed shall be cut at approximately 6 inches above the soil. In order to prevent erosion plants shall not be removed by their roots.
- Stumps of plants removed shall be painted with an herbicide to help prevent resprouting.

 Debris and trimmings produced by thinning and pruning shall be removed from the site.

# Pruning

Pruning of the plants retained will further reduce the fuel load. The hard chaparral species targeted for retention can be shaped into attractive fire safe specimens by pruning dead and excessively twiggy growth. Pruning shall be accomplished in the following manner:

Individual plants retained will be pruned to remove 40 percent of the flammable fuel. Pruning should remove dead, dying and excessively twiggy growth. Figure 18 illustrates the desired result of pruning.



Figure 18. Pruning of Retained Vegetation

Trees and larger tree form shrubs (i.e. manzanita and redshank) which are being retained shall be pruned to provide clearance of three times the height of the understory plant material or six feet whichever is higher. Figure 19, below illustrates this requirement.

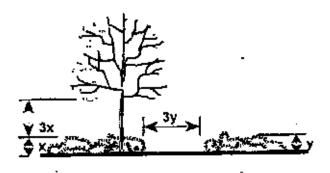


Figure 19. Pruning Trees and Tree Form Shrubs for Brush Management

- All plants retained including tree form shrubs shall be separated by a distance three times the height of the tallest adjacent plants (Figure 19).
- Debris and trimmings produced by thinning and pruning shall be removed from the site.

## 3.2.4 Additional Requirements and Recommendations

The following additional requirements and or recommendations apply to the development of the site.

- No propane tanks allowed within 10 feet of structure.
- 10 feet of fire clearing is required around propane tanks
- Water detention basins, if located within 100 feet of structure shall be maintained free of flammable vegetation.

#### 4.0 RISK ASSESSMENT- STRUCTURES

For technical analysis purposes, it is assumed that lots would be developed with technology business park uses and with industrial uses. These may include but are not limited to:

- Research and Development Facilities;
- High Tech facilities including manufacturing of computer components, etc;
- Warehouses;
- High piled stock storage;
- Recycling Facilities;
- Custom manufacturing;
- Fabrication:
- Compounding;
- Processing;
- General Industrial:
- Agricultural Uses;
- Winery;
- Truck Parking

The most likely threat of a significant on-site fire would be a structural fire. It is probable that large warehouses and manufacturing facilities will be constructed on various lots. Fires in warehouses are based upon large amounts of materials located in a single fire area or building. Commonly stored plastic materials have the potential to burn rapidly, have high rates of heat release, and generate large amounts of combustion products. Depending on the type of materials stored, rapidly spreading fires can occur and overpower fire sprinkler systems (discussed in Section 5.2, below).

Warehouse buildings may be classified, per Building Code, as B (office) S-1 (Moderate hazard storage not classified as S-2), S-2, or H. Industrial/manufacturing buildings are usually either F-1 or 2, or H occupancies.

Industrial manufacturing risks vary based upon the type of industry. These occupancies may be "H" occupancies per the Building Code and will need to comply with the

Building Code (including size and construction of buildings, location on property, distance from property line and from other buildings, etc.) in addition to the Fire Code. H rooms designed in accordance with the Building Code may be allowed within buildings. The H occupancy classification can be avoided by staying within exempt quantities and by the use of control areas as allowed in the Fire and Building Code.

Occupancies with materials containing a high explosive hazard (typically anH-1 occupancy per the California Building Code) are not allowed by the Specific Plan. This would include fireworks manufacturing or storage. Special attention is needed for H-1 occupancies; including those with combustible dusts involved, and which present a moderate explosion hazard or hazard from accelerated burning, per Section 307 of the California Building Code. This includes certain uses and storage of flammable liquids, oxidizers, and Class 3 water reactive materials. H-2 occupancies must be located at least 30' from a property line if the building is over 1000 square feet, per Building Code Section 503. Buildings where explosion venting is required, per Fire Code Sections 7902, 7903 and 8003 and Building Code Chapter 307.10, require a clear ventricle space above the building or a 50' horizontal distance from the structure wall at the location where the explosion venting system is. Refer to the codes for details. It will be important for the owner of the development to have their architect analyze all specific requirements for a proposed occupancy on a lot before finalizing proposed lot sizes and before proceeding with design, to be sure the size and type of occupancy will be feasible based on the lot size, distance to property lines, and adjoining buildings, public ways, etc. In addition, the Fire Code has specific requirements for the amount and type of hazardous materials, flammable and combustible liquids and compressed or liquefied gases stored on the exterior of buildings on the lot.

The following are the most likely to result in a structure fire:

- Electrical system malfunctions; particularly wiring and extension cords.
- Fire in high piled stock due to carelessly discarded smoking materials, electrical or heating source, chemical reaction, etc.
- Fire or explosion at an industrial plant.
- Spotting of Airborne burning debris from an off-site, wind driven, vegetation fire onto a roof of into an HVAC inlet, open smoke vent, through other building vents, open door, or through an open glass window (broken due to airborne debris).
- Heating equipment or system malfunction.
- Careless smoking.
- Truck fire spreading into building from loading dock.
- Arson to cover up a crime.
- Forklift fire including ignition from hydrogen from charging batteries for fork lifts and refueling LPG forklifts inside a building.
- Spontaneous heating or chemical reactions of stock.
- Welding or open frame construction of racks, etc.
- Fire in exterior storage due to chemical reaction, carelessly discarded smoking material, arson, etc.

In addition, there is a potential for crashes in the area, due to Brown Field and the Tijuana Airport. This would most likely be a cargo type of aircraft or personal pleasure aircraft. Small aircraft traffic can result in mid air collisions over the development area. This project does not, however, increase the risk of air crashes.

Large quantities of exterior storage are discouraged due to the potential fire exposure hazard. Quantities of exterior storage should not exceed exempt quantities per tables in the Fire Code.

#### 4.1 Hazardous Materials

In addition to EMS calls and Fire calls, there is a potential for Hazardous Materials emergencies in the project. These can occur in transportation, storage, use, and handling. Hazardous Materials include combustible and flammable liquids, flammable gasses, toxic liquids and gasses, explosives, reactive and unstable materials, oxidizers, etc. The incidents will most likely occur on the area of freeways, highways, or other roads during transportation. This potential creates the risk of a flammable or toxic cloud or spill impacting the highway as well as exposing humans and buildings on either side of the border. Such release, as in gases, can result in a flammable or toxic cloud, which can leave the property of origin and expose persons and property off-site. A major fire in an industrial or storage facility may result in a major Hazardous Materials release, or toxic smoke spreading off-site.

# 4.2 **Building Construction**

In general, new warehouses are concrete tilt up construction. They are usually one-story buildings generally ranging from approximately 26' high to 38'6' high. The construction methods for exterior wildfire exposure in a wildland-urban interface fire area shall be as provided in Chapter 7A of the County Building Code. Buildings shall be setback at least 30' from property lines in order to comply with the Sec. 4707.1.1 of the Consolidated Fire Code.

The buildings should have parapets to assist in controlling fire spread. It is recommended that the parapets be 6' or less, to a minimum of 30". It is also recommended that the parapets have suitable approved roof access points through the parapet on each side of the building, at the corners, and in the middle of the wall between each end on each side, for Fire Department ladder truck crew access through the parapet wall. Such access points shall be marked with reflective signage on both sides, allow access directly onto or off of the roof itself, without climbing over the parapet and shall not be locked. Details shall be submitted to the Fire District for approval.

Warehouse buildings generally have small (4,000 to 10,200 square foot) offices, which have HVAC systems. All HVAC systems should have the capability to be easily shut down or put in recirculation, by occupants or firefighters, using readily accessible and labeled controls, so as to not allow smoke to enter the building in the event of a

vegetation fire in the area, and be properly screened to prevent intrusion of sparks and burning debris.

## Additional Requirements and Recommendations:

- Building shall be separated by a minimum of 50 feet.
- Buildings shall have fire sprinkler in conformance with NFPA 13 and as discussed in Section 5.2.
- All buildings shall be provided with the means for firefighters to remove smoke, such as roof vents that open, or approved smoke control and removal systems.
- Interior partitions between tenants units in buildings should be at least 1-hour fire rated walls, or may be required to be a higher rating if required by the California Building Code.
- Buildings shall have KNOX data and key boxes at main entrances to Fire District
  approval. Additionally it is recommended that the data boxes also contain a
  suitable floor plan, showing location of sprinkler risers, alarm panels, HVAC
  controls, gas shutoffs, electrical panels, any roof access stairs and an updated list
  of the types of commodities stored in the building.
- Buildings shall have approved stairways to provide firefighter access to the roof.
- Any buildings intended for high piled stock shall comply with article 81 of the Fire Code; including firefighter access doors every 100' lineal feet, smoke vents or smoke removal systems per the Fire Code, and wet standpipes. Fire fighter access doors shall be openable from the outside emergency personnel with locking devices that can be accessed expeditiously. Smoke vents shall be able to be opened manually from the rooftop and from the warehouse floor. High piled stock buildings should assume storage of high hazard commodities and plastics.
- Any awnings on buildings, such as over the loading docks, should be noncombustible, provided with sprinklers and designed so as to not collapse during fire.
- Exterior storage of LPG, LOX, ammonia, acids, flammable or combustible liquids or gases and other hazardous materials, shall be located away from buildings and property lines, in compliance with the Fire Code, and shall have proper construction in fire protection and proper labeling. Articles 79 and 80 of the Fire Code list the required distances from buildings, property lines and public ways for hazardous materials and flammable and combustible liquids. Articles 74 and 80 regulate compressed gases. LPG is regulated by Article 82. Developers and architects for specific lots must check the Fire Code exterior storage and spacing requirements when designing and building and lot.
- Any vehicle wrecking yards must comply with Fire Code Article 34.
- Any fueling of vehicles on lots must comply with Fire Code Article 52.
- Any parking structures will need to comply with NFPA Standards and the Fire Code including fire sprinklers and wet standpipes.
- Any building storing Hazardous Materials or flammable or combustible liquids shall have the NFPA hazard (diamond) symbol displayed on the street side of the building and over the entrance to the storage area. Occupancies with significant hazardous materials risks should provide additional funding, above the basic

RFPD funding requirements, for Hazardous Materials equipment, firefighting foam, etc.

- Forklift refueling stations shall be outside.
- Battery charging will have proper protection, ventilation and spill control.
- Trash areas and containers will be on the exterior of buildings and should not be connected to the interior of a building. The locations shall be to the approval of the Fire District. Trash dumpsters within 5 feet of a building should have exterior sprinkler protection or be in a 1 hour rated enclosure. Large exterior dumpsters should have 2.5 inch diameter Fire Department Connections on them.
- Fire extinguishers shall be provided throughout all buildings, including at each loading dock door (in the event of a truck fire).
- Sprinkler head deflectors and lighting fixtures shall be so located to assure a 3 foot clearance from storage, or more if necessary.
- Tenant Improvements and Fire Permits: Plans for Tenant Improvements shall be submitted to the Rural Fire Protection District and the County Department of Planning and Land Use for review and approval prior to occupancy of original or subsequent tenant. Plans shall include Fire sprinkler plans and calculations and shall also address all applicable Fire Code requirements and High piled Stock permit submittal requirements as found in Section 8101.3.2 of Fire Code Article 81. Any Fire Permits required by Section 105 of the California Fire Code shall also be applied for.
- Redundant methods to call 911 should be provided, such as hard line phones and cellular phones. Landlines should be the primary means of contact with emergency services as cell phones and their lack of identification of specific address may delay responses.
- Emergency plans: Each tenant should have a bi-lingual Emergency Plan which includes steps for employees to take in an emergency, and makes it clear who is assigned to call 911. Manual fire alarm systems will be provided as needed to alert employees.

### 5.0 WATER SUPPLY

The Otay Water District (OWD) will provide potable water services. The project will install connections and mains from the existing 10-inch water main in part of Otay Mesa Road, the existing 12-inch water main in Alta Road and the existing 12-inch water main in part of Airway Road. The proposed water facilities would include 12-inch water mains in Calle Ventner, Airway Road, Camino Del Mayer, Old Otay Mesa Road and Streets A-D. In addition, the project will install a 24-inch recycled water main in Alta Road, 8-inch recycled water mains in Camino Del Mayer, and 6-inch recycled water mains in Streets Athrough D. Future recycled water mains that are not to be constructed by the project include a 16-inch main in Airway Road west of Alta Road and an 8-inch main in parts of Old Otay Mesa Road west of Alta Road.

A State-mandated Water Supply Assessment (California State Water Code Section 10910) is required to determine the project's long-term water supply availability, in

accordance with Senate Bill 610, because the planned industrial park meets at least one of the criteria for a "project" as defined in Section 10912 of the State Water Code: a proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 s.f. of floor area. As a result, the OWD has prepared a Water Supply Assessment for the proposed project that complies with California State Water Code Sections 10910 and 10911. The report was approved by the OWD in October 2007 and no further action is required. The overall water demand projections are consistent with the approved assessment (PBS&J 2008).

OWD provided fire flow calculations at the request of the project (Appendix F). The required fire flow for the project is anticipated to range from 3,500 to 4,000 gpm (PBS&J 2008). The fire flow calculations are a worst case scenario making the following assumptions: the water level in the storage facility is at the minimum operational level, the prescribed two hour fire duration occurs during maximum day demand, into and out of the pressure zone where the fire is occurring the all agency booster pumps are off and areas outside of the fire circumference in the same pressure zone maintain a minimum pressure of 20 PSI. Based on a current static pressure of 131.6 PSI the results are as follows:

Static Pressure: 86.7 PSI (System demand only at maximum day condition)
Residual Pressure: 64.3 PSI (System and Fire Flow Demand of 2500 GPM)

Flow at 40 PSI: 6354 GPM Flow at 20 PSI 8177 GPM

Based on the results of the fire flow calculations provided by OWD there appears to be adequate water supply available to the site for a water supply system to be designed to provide the required fire flows for both hydrants and sprinkler systems.

Hydrant spacing on the public streets shall be at 350 foot intervals. Hydrants shall comply with the County Fire Code with regard to composition and outlets. The minimum fire flow requirement in the WUI is 2500 GPM at 20 PSI in the main (County Fire Code 2004). The fire flow shall be sufficient for the sprinkler system supply plus 500 GPM for hose streams or be designed to provide the fire flow required by State Fire Code Appendix III-A (based on square footage and type of construction) with up to a 75 percent credit for sprinklers, whichever flow is greater. In no instance shall the flow be less than the 2500 GPM required by the County Code. As can be seen in Table A-III-A-1 of the California Fire Code, without a reduction as a result of having sprinklers, depending on the type of construction a building exceeding 9401 square feet will exceed the 2500 GPM mandated by the County. The required flows shall be available at times of maximum peak domestic and industrial use. The final water supply design for and hydrant locations for the project shall be approved by the District prior to approval.

The following additional requirements apply to the entire project:

- Hydrants shall have two 4-inch outlet connections and one 2.5 inch outlet connection per the Fire District standard or other configuration required by the Fire Marshal.
- Hydrants shall be a minimum of 40 feet from the building or have a two hour fire wall at the location of the hydrant.
- Lateral valves shall be 10 to 25 feet from hydrant.
- Hydrants shall be place on a 3'X3' concrete pad to prevent buildup of weed and vegetation.
- Blue dot hydrant markers must be installed at each hydrant
- Red dot markers must be installed at each Fire Department Connection (FDC).
- Hydrants shall not have obstructions within 3 feet or trees within 10 feet nor shall the fire department connections.
- Any required fire pump system requires two redundant listed or approved fire pumps complying with National Fire Protection Agency (NFPA) Standard 20 (Standard for the Installation of Stationary Pumps for Fire Protection). One of the pumps shall be diesel or approved emergency power shall be provided.
- Hydrants, sprinkler system connections, fire department connections and any exterior sprinkler risers located within 4 feet of the face of a curb or in areas of truck traffic, including backing shall have crash posts. Crash posts shall be 4 feet on center, a minimum of 3 feet high, set not less than 3 inches deep in a concrete footing not less than 15 inches in diameter. Posts shall not interfere with the operation of fire hydrants or fire department connections.

#### **5.1** Water Supply for Individual Lots

Hydrants are required on the individual lots when the distance from a hydrant in the street exceeds 150 feet. Additional hydrants are recommended on individual lots at approximately 300 foot intervals along fire lanes due to the industrial use and the need for tactical positioning of fire apparatus. The on-site water supply to the individual lots shall be part of the public water supply system to ensure the ongoing maintenance and operability. The water supply system design for each lot as it develops shall be reviewed and approved by the Water District and Fire District as part of the site plan process. The Districts should be contacted to determine the requirements specific to the proposed layout and use of the site.

#### 5.2 Fire Sprinklers

All buildings with the project shall have remotely supervised automatic fire sprinkler systems. Fire sprinkler and alarm systems shall be designed by a qualified professional in conformance with NFPA 13, Standard for the Installation of Sprinkler Systems and NFPA 72, National Fire Alarm Code. The systems may be "Early Suppression, Fast Response" (ESFR) ceiling mounted sprinklers or non-ESFR systems with in-rack sprinklers. The required fire flow for the sprinkler system shall be based on the building size, construction material, commodity storage and height or manufacturing risk as

applicable. The County Standard for spec buildings is 0.45 GPM/3000 square feet. Higher flows may be required based on the size and/or use of the building. Certain occupancies could require other types of fire suppression systems such as foam or water mist.

As part of the site plan approval and building permit process a water supply system including amount of flow for the approved sprinkler design plus hose streams shall be designed. The water system shall be submitted for review and approval by the District prior to construction. At a minimum warehouses shall be designed for 0.45 GPM/3000 square feet. Buildings on any lot will need to have fire protection systems designed to operate within the available fire flow and pressure from the public water system. This may result in a limitation on building size or type of occupancy.

Each building shall have a separate fire department sprinkler connection. It shall be located a minimum of 10 feet from the street curb (if applicable) and 40 feet from the building on the address side of the building. Risers and valves shall be on the exterior of the building or be in a fire rated enclosure directly accessible from the exterior of the building.

#### **5.3** Fire Monitoring Systems

All buildings shall be supplied with supervised automatic fire sprinkler systems. The sprinkler systems and valves shall be supervised 24 hours a day, 7 days a week (24/7) by an approved monitoring company. Each building shall have a zoned graphic fire alarm annunciator at the main entrance to the building. Annunciators and graphic display panels disclose the layout and annunciate the status of fire alarms of buildings and manufacturing facilities. The annunciator shall monitor and annunciate all sprinkler risers and zones and any smoke detection zones.

The sprinkler alarm bell shall be located on the address side of the building. The bell shall also have a flashing red light to indicate which riser is flowing. Signs stating to call 911 if the bell is ringing shall be in both Spanish and English.

#### 6.0 ACCESS AND TRAVEL TIME

The following sections discuss access requirements and travel time.

#### 6.1 Access Requirements

Access to the site would be from Otay Mesa Road, Alta Road, Airway Road and Siempre Viva Road. Several public roads would provide internal circulation. To accommodate proposed project traffic and improve traffic flow in the vicinity, the proposed project would build and dedicate public ROW for the eventual extension of roads fronting and crossing the project site, if these roads are not otherwise constructed by other development proposals in the area. Specifically, the project would grade and construct

half-width improvements for segments of Otay Mesa Road and Alta Road. The project would grade full-width off-site sections and build half-widths of these sections of Airway Road east of Alta Road and Siempre Viva Road east of its proposed intersection with Airway Road. The project would grade and build full-width sections of Lone Star Road (formerly known as Loop Road) and other internal connectors on site. The project would also grade, but not construct, off-site segments of Alta Road and Siempre Viva Road east of Alta Road to facilitate installation of underground utilities (e.g., sewer lines and force mains). Dedication of the ROW and the eventual construction of the full improvements would satisfy and implement the road standards contained in the EOMSP, as amended. All roads must be built in an order that will keep the project in conformance with cumulative allowable dead-end lengths regardless of phasing. Street A and Street B are both designed as cul de sacs. Street A is approximately 650 feet. Street C is approximately 1100 feet in length. The smallest parcel proposed as a result of SPA that would take access from either road is Proposed Parcel 6 which is 1.4 acres. Both streets are in compliance with the maximum allowable dead-end length of 1320 feet for parcels zoned for 1 to 4.99 acres. Street C is also a dead-end. The cumulative dead-end length from the proposed driveways for Parcels 30 and 31 to the intersection of Siempre Viva Road and Lone Star Road is 1320 feet. The smallest proposed parcel that will take access from Street C is Parcel 29, which is proposed to be 1.6 acres. The dead-end length for access for Parcel 33 to the intersection of Lone Star Road and Siempre Viva is approximately 1100 feet. The smallest proposed parcel that will take access from this portion of Lone Star Road is Parcel 33 which is proposed to be 2.9 acres. The project is in compliance with allowable cumulative dead-end road lengths. Lastly Siempre Viva terminates at the eastern project property line. The dead-end length from the terminus west to the intersection with Lone Star Road is approximately 1200 feet. The smallest proposed parcel that will take access from this portion of Siempre Viva is Parcel 27 which is proposed at 2.2 acres. Please refer to Table 1 for a listing of propos parcel size by lot. Please refer to Tables 5 and 6, and Figures 20 and 21 for the locations of proposed on-site and off-site roads.

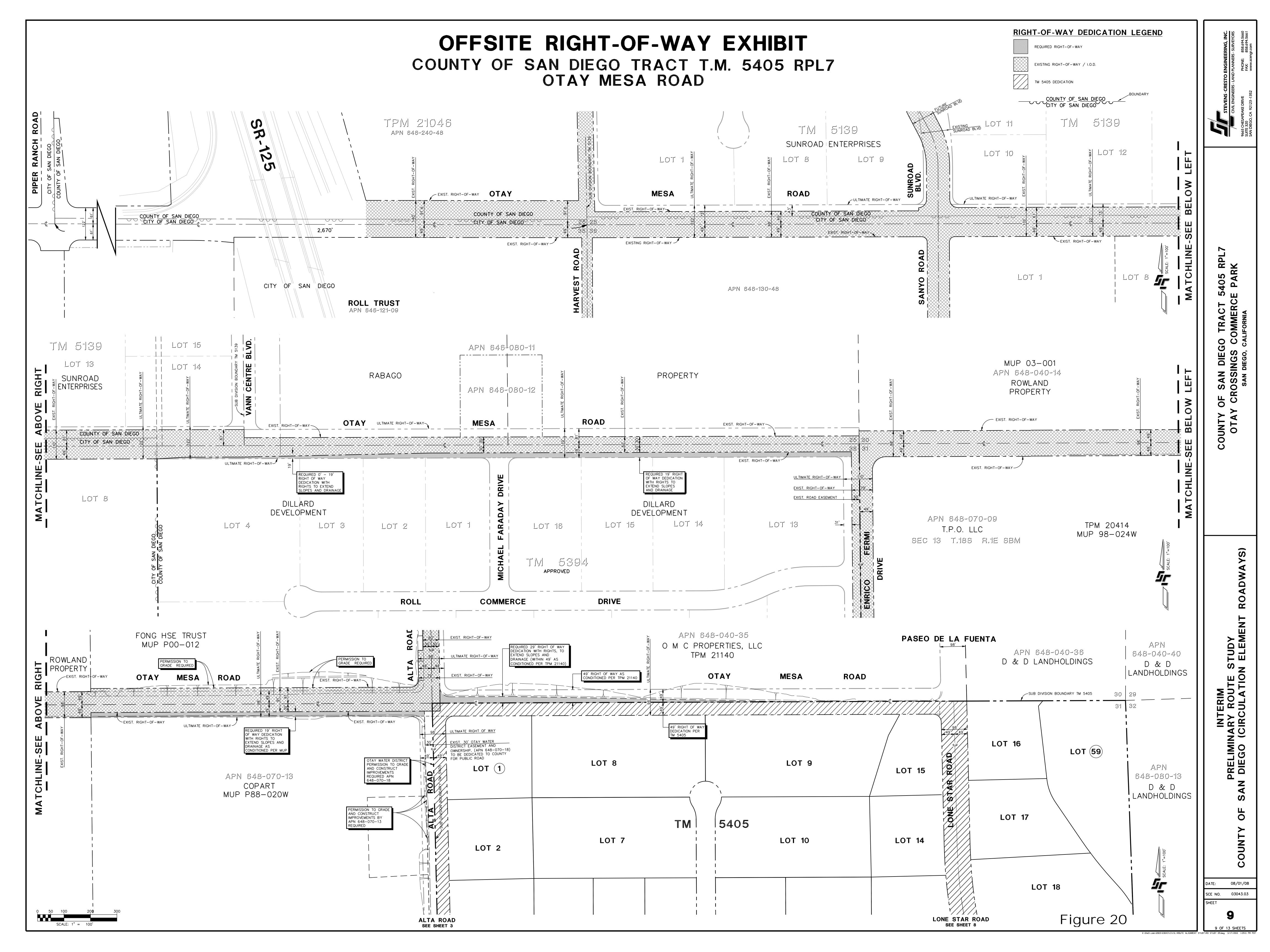
SUMMARY OF PROF	POSED I	Table ROADW		GMENT	IMPRO	VEMENTS					
	Exis	sting Plu	s Projec	t Condit	ions	Ultimate					
Roadway Segment	Unit	Units	Units	Units	Units	Classification					
	1	1-2	1-3	1-4	1-5	per EOMSP					
	Off-Site	e Roadw	ay Segm	ents							
Otay Mesa Road											
Alta Road to Lone Star Rd	N/A	LC	TC	TC	TC	4M					
Alta Road											
Otay Mesa Rd to Calle	LC	LC	TC	TC	TC	4M					
Ventner	LC	LC	IC	1C	1C	41 <b>VI</b>					
Calle Ventner to Street	N/A	N/A	LC	LC	LC	4M					
'B'	1 <b>N</b> /A	1 <b>V</b> /A	LC	LC	LC	4111					
Street 'B' to Airway Rd	N/A	N/A	N/A	LC	LC	4M					
Airway Rd to Siempre Viva Rd	N/A	N/A	N/A	N/A	N/A	4M					

		Table				
SUMMARY OF PROF						
		sting Plu				Ultimate
Roadway Segment	Unit	Units	Units	Units	Units	Classification
	1	1-2	1-3	1-4	1-5	per EOMSP
Airway Road		r	r		1	
Alta Rd to Siempre Viva	N/A	N/A	N/A	LC	LC	4M
Rd	14/11	14/11	14/11	LC	LC	71/1
Lone Star Road		ı	ı	1	T	1
Otay Mesa Rd to Calle	N/A	LC	TC	TC	TC	4M
Ventner	14/11	LC	10	10	10	7171
Calle Ventner to Siempre	N/A	LC	LC	LC	LC	4M
Viva						
Siempre Viva to Street 'C'	N/A	N/A	N/A	2 I/C	LC	4M
South of Street 'C'	N/A	N/A	N/A	2 I/C	2 I/C	4M
Calle Ventner						
Alta Rd to Street 'A'	2 I/C	2 I/C	2 I/C	2 I/C	2 I/C	Non-CE (2
Alta Ru to Street A	21/0	21/0	21/0	21/0	21/0	I/C)
Street 'A' to Lone Star Rd	2 I/C	2 I/C	2 I/C	2 I/C	2 I/C	Non-CE (2
	21/0	21/0	21/0	21/0	21/0	I/C)
Siempre Viva Road		ı	ı	1	1	1
Alta Rd to Airway Rd	N/A	N/A	N/A	N/A		4M
Airway Rd to Lone Star	N/A	N/A	2 I/C	LC	LC	4M
Rd						
East of Lone Star Rd	N/A	2 I/C	2 I/C	2 I/C	2 I/C	4M
Street 'A'	1	Г	Г	1	T.	I
North of Calle Ventner	2 I/C	2 I/C	2 I/C	2 I/C	2 I/C	Non-CE (2
	21/0	21/0	21/0	210	21,0	I/C)
Street 'B'		ı	Τ	ı	1	
East of Alta Rd	N/A	N/A	2 I/C	2 I/C	2 I/C	Non-CE (2
	1 1/1 1	1 1/ / 1	21,0	21,0	2.70	I/C)
Street 'C'		ı	Т	ı	1	1
East of Lone Star Rd	N/A	N/A	N/A	2 I/C	2 I/C	Non-CE (LC)

EOMSP = East Otay Mesa Specific Plan; 4M = 4-lane Major Road; TC = Town Collector; LC = Light Collector; 2- I/C = 2-Lane Industrial Commercial Collector; Non CE = Non Circulation Element Road; N/A = Not Applicable because this roadway segment will not be constructed until a later Unit of development

Source: Darnell & Associates 2010. (Excerpted from Table 37 of TIS).

Several roads are proposed within the project site in addition to the roads along the subdivision boundary identified in Table 5 above Additional on-site intersection improvements as identified in Table 6 will result in smooth traffic flow. The road system as designed allows for multiple locations for ingress and egress from the project site.



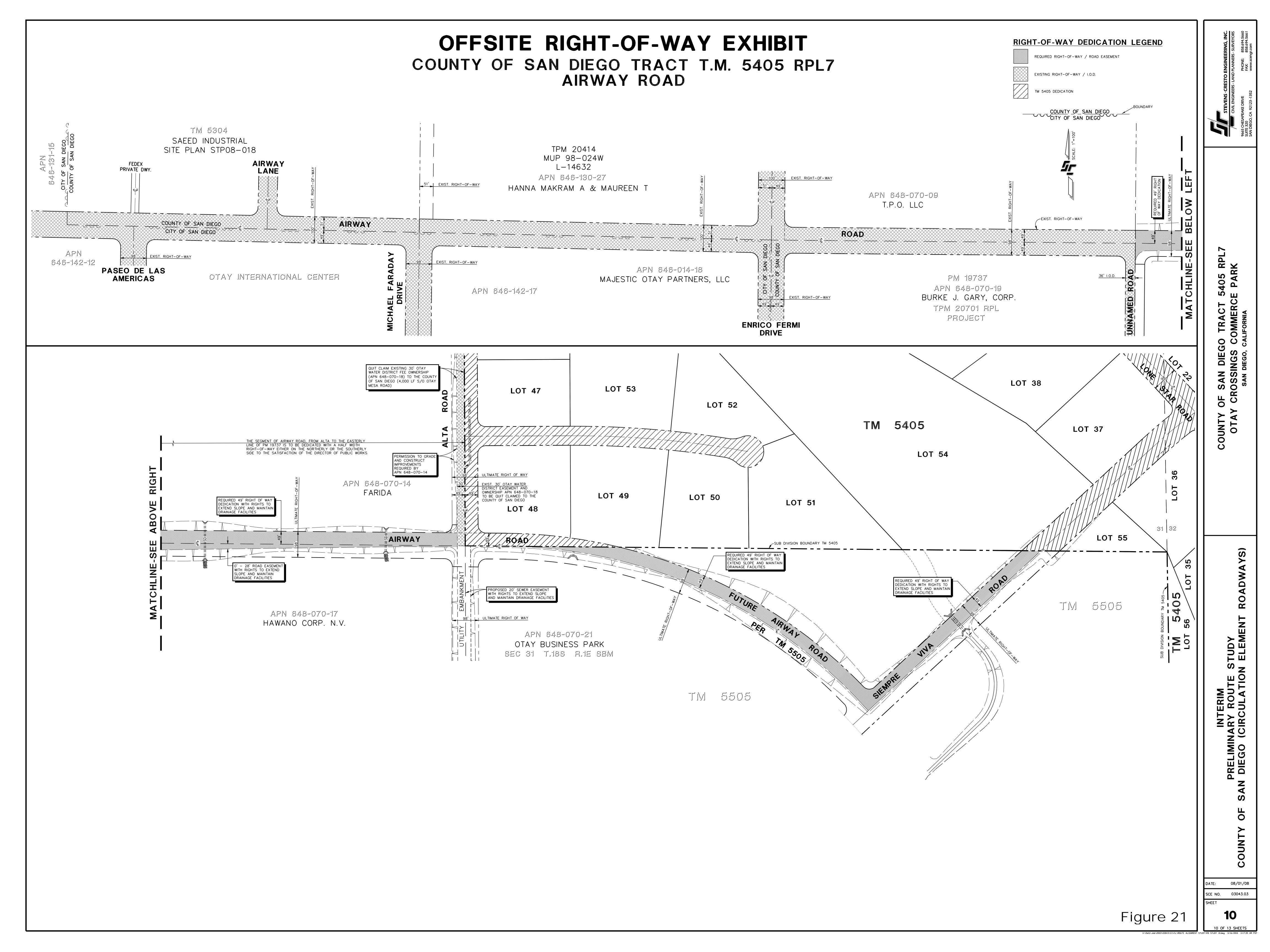


	Table 6*
Summar	y of Proposed on-Site Intersection Improvements
Intersection	Ultimate Improvement
Otay Mesa Rd @ Lone Star Rd (Paseo De La Fuente)	Prior to recordation of final maps for Unit 2, the applicant will install a stop sign on the eastbound approach (west leg) of the intersection to provide OWSC and construct the following lane configurations: 1-EBL-R, 1-NBT-L & 1-SBT-R.
Alta Rd @Calle Ventner	Prior to recordation of final maps for Unit 3, the applicant will install a stop sign on the westbound approach (east leg) of the intersection to provide OWSC and construct the following lane configurations: 1-WBL-R; 1-NBT-R; 1-SBL-U; 1-SBL; & 1-SBT.  Prior to recordation of final maps for Unit 4, the applicant shall signalize and widen the intersection to provide the following lane configurations: 1-WBL-R; 1-NBT-R; 1-SBL-U; 1-SBL; & 1-SBT.
Alta Rd @ Street 'B'	Prior to recordation of final maps for Unit 4, the applicant will install a stop sign on the westbound approach (east leg) of the intersection to provide OWSC and construct the following lane configurations: 1-WBL-R; 1-NBT-R & 1-SBT-L.
Alta Rd @ Airway Rd	Prior to recordation of final maps for Unit 4, the applicant will install a stop sign on the southbound approach (north leg) of the intersection to provide OWSC and construct the following lane configurations: 1-EBL; 1-EBT; 1-EBT-R; 1-SBL-R & 1-SBR.
Lone Star Rd @ Calle Ventner	Prior to recordation of final maps for Unit 2, the applicant will install a stop sign on the eastbound approach (west leg) of the intersection to provide OWSC and construct the following lane configurations: 1-EBL-R; 1-NBL; 1-NBT; 1-SBU & 1-SBT-R.
Lone Star Rd @ Siempre Viva Rd	Prior to recordation of final maps for Unit 3, the applicant will install a stop sign on the southbound approach (north leg) of the intersection to provide OWSC and construct the following lane configurations: 1-EBT-L; 1-WBT-R; 1-SBL-U & 1-SBL-R.  Prior to recordation of final maps for Unit 4 install stop signs on all approaches to the intersection to provide AWSC and construct the following lane configurations: 1-EBL; 1-EBT-R; 1-WBT-LR; 1-NBT-LR; 1-SBT-L & 1-SBR.  Prior to recordation of final maps for Unit 5 install stop signs on all approaches to the intersection to provide AWSC and construct the following lane configurations: 1-EBL; 1-EBT; 1-EBR; 1-WBT-LR; 1-
Lone Star Rd @Street 'C'	NBL; 1-NBT-R; 1-SBT-L & 1-SBR.  Prior to recordation of final maps for Unit 4, the applicant will install a stop sign on the westbound approach (east leg) of the intersection to provide OWSC and construct the following lane configurations: 1-WBL-R; 1-NBT-R; 1-SBL & 1-SBT.
Calle Ventner @ Street 'A'	Prior to recordation of final maps for Unit 1, the applicant will install a stop sign on the southbound approach (north leg) of the intersection to provide OWSC and construct the following lane configurations: 1-EBT-L; 1-WBT-R & 1-SBL-R.

E+1 = Existing + Project Unit 1; E+ 2 = Existing + Project Units 1-2; E+ 3 = Existing + Project Units 1-3; E+ 4 = Existing + Project Units 1-4;

 $E+5=Existing+Project\ Units\ 1-5;\ C\ w/o\ 905=Cumulative\ w/o\ SR-905+Project\ Phases\ 1+4;$   $C\ w/905=Cumulative\ w/SR-905\ Phases\ 1A\ \&\ 1B+Project\ Phases\ 1+4;\ OWSC=One-Way\ Stop-Controlled;$   $AWSC=All-Way\ Stop-Controlled;$ 

EBL = Eastbound Left; EBT-L = Eastbound Shared Through-Left; EBT-LR = Eastbound Shared Through Left-Right; EBT = Eastbound Through;

EBT-R = Eastbound Shared Through Right; EBR = Eastbound Right; EBL-R = Eastbound Shared Left-Right; WBL = Westbound Left;

WBT-L = Westbound Shared Through-Left; WBT-LR = Westbound Shared Through Left-Right; WBT = Westbound Through;

WBT-R = Westbound Shared Through Right; WBR = Westbound Right; WBL-R = Westbound Shared Left-Right; NBL = Northbound Left;

NBT-L = Northbound Shared Through-Left; NBT-LR = Northbound Shared Through Left-Right; NBT = Northbound Through;

NBT-R = Northbound Shared Through-Right; NBR = Northbound Right; NBL-R = Northbound Shared Left-Right;

SBL-U = Southbound Shared Left-U Turn; SBL = Southbound Left; SBT-L = Southbound Shared Through-Left;

 $SBT-LR = Southbound \ Shared \ Through \ Left-Right; \ SBT = Southbound \ Through; \ SBT-R = Southbound \ Shared \ Through-Right; \ SBR = Southbound \ Right;$ 

SBL-R = Southbound Shared Left-Right; N-S = North-South Roadway; E-W = East-West Roadway; Source: Darnell & Associates 2010 (Excerpted from Table 41 of TIS).

All roads within the project, including on the individual lots must be built to the requirements of the District including but not limited to: the ability to with stand the load of heavy fire apparatus (as much as 75000 lbs for aerial ladder fire truck), named with signage at all intersections, and fire lanes posted. Due to the location of the project site the fire lane signs should be in English and Spanish. In addition, all signalized intersections shall be shall install preemptive devices (Opticom).

The exact requirements for each individual lot will be determined at the time of the site plan review. The proposed access for an individual lot shall be reviewed and approved by the District. The following additional requirements and recommendations apply to roads and driveways on each lot.<sup>1</sup>

- On-site fire roads shall be a minimum of 28 foot improved and unobstructed.
   Such roads shall be posted "Fire Lane No Parking". Parking on roads shall require additional width.
- Roads or driveways exceeding 150 shall have a District approved turnaround.
- Cul-de-sac bulbs should be at least 72 feet in diameter for fire truck turning.
- Roads shall be within 150 feet driving distance of any portion of the exterior wall.
- During site design where possible, roads should be designed to encircle the building for fire truck access.
- Centerline of on-site access roads should be located parallel to and within reasonable proximity of the exterior walls of a building to allow safe use of ground or aerial ladders by firefighters.<sup>2</sup>

<sup>&</sup>lt;sup>1</sup> Fire fighter foot access shall be provided around all sides of buildings. Foot access is typically 6 feet in width with an all weather surface. Exact requirements shall be determined at the time of the site plan review.

<sup>&</sup>lt;sup>2</sup> Typical climbing angle is approximately 70 degrees. Typical angles for use of an aerial water stream is 60 to 80 degrees. An aerial ladder truck starts at approximately 6' above the ground.

- Lots proposing private roads shall be required to develop an enforceable mechanism to ensure that the roads will be maintained in conformance with the requirements including the requirement to keep fire lanes unobstructed.
- Proposed gates on private roads or driveways shall be reviewed and approved by the District as part of the site plan review.
- Gates shall be provided with KNOX switches and keyed to allow Law Enforcement use.
- Gates shall also have emergency traffic control-activating strobe light sensors (Opticom) or other devices approved by the Fire Chief that shall activate on the approach of fire apparatus.
- Gates shall also have a battery backup and manual mechanical disconnect in case of power failure.

#### **6.2** Travel Time

The Public Facility Element of the General Plan for the County of San Diego (as amended), Section 11 – Fire Protection and Emergency Services establishes goals for the delivery of services. The goal to minimize the loss of lives from fires is identified in the plan as a maximum travel time of 5 minutes for the land use category "Town" which is defined as single-family residential lots of less than two acres, or more intensive uses such as multi-family residential and includes all industrial development and all commercial development except neighborhood commercial. According to the project facility availability form the expected emergency travel time to the proposed project is 5 minutes (Appendix G) from the closest station, Station 65, located at 480 Alta Road, Otay Mesa. The station is approximately 1.9 miles from the farthest lot. Travel time pursuant to Table C.11(b) of NFPA using a safe travel speed of 35 MPH is 3.88 minutes. The project is in compliance with the required travel time.

The next nearest station that would respond is San Diego Fire Station 43 located at 1590 La Media Road, near the intersection of La Media and Otay Mesa Road. This station is approximately 3.8 miles from the farthest lot. Travel time pursuant to Table C.11(b) of NFPA using a safe travel speed of 35 MPH is 7.11 minutes.

#### 7.0 ADDRESSES

All buildings are required to be separately addressed and unit numbers shall be placed at appropriate locations and be plainly visible and legible from the street fronting the property from either direction of approach. The numbers shall contrast with their background and shall meet the following minimum standards as to size: 12 inches high with a 1 inch stroke. In addition, geographical directories may be required at entrances to multiple building developments on a parcel.

#### 8.0 RESPONSIBILITIES

This section identifies the responsible parties for conformance and implementation of this plan.

#### Conformance

The ultimate responsibility for conformance with the fire protection plan lies with the property owner as identified on the County Tax Assessors Maps. These clearing requirements shall be included in the CC&R's for the project.

#### Conformance Approval

Conformance approval is under the jurisdiction of the Rural Fire Protection District and the County of San Diego.

#### 9.0 REFERENCES

County of San Diego 1979. General Plan – Safety Element.

County of San Diego 1994. East Otay Mesa Specific Plan (EOMSP) Site Planning and Design Guidelines (as amended)

County of San Diego 2009. San Diego CountyConsolidated Fire Code, November 2009.

County of San Diego 2008. County Fire Code, Ord. No. 9915 (N.S.), effective 1-30-08)

County of San Diego 2008. County Building Code, Ord. No. 9915 (N.S.), effective 1-30-08.

National Fire Protection Agency 2007. NFPA 13: Standard for the Installation of Sprinkler Systems.

National Fire Protection Agency 2007. NFPA 20: Standard for the Installation of Stationary Pumps for Fire Protection

National Fire Protection Agency 2007. NFPA 72: National Fire Alarm Code

Western Fire Chiefs Association and California Building Standards Commission 2001. 2001 California Fire Code, California Code of Regulations Title 24, Part 9.

# APPENDIX A WEATHER DATA

#### Station Metadata

From NCDC Station Historical Listing for NWS Cooperative Network ObsTyp: t-Temperature-1, p-Daily precip-2, w-(blank), s-(blank), e-Evap-5 h-Hourly precip - 6 0.01" Universal, or - 7 0.10" Fisher-Porter U - Observed, but beginning date is uncertain

Count	Number	Station Name	Lat	Long	Elev	Start	ObsTyp	End
	(Coop)	(From NCDC listing)	ddmm	dddmm	ftx10	yy mm	tpwseh	yy mm
							=====	: ————
524	041758- 6	CHULA VISTA	3236	11706	0001	31 01	UU	85 04
525	041758- 6	CHULA VISTA	3236	11706	0006	85 04	1 U	99 99

### CHULA VISTA, CALIFORNIA (041758)

#### **Period of Record Monthly Climate Summary**

Period of Record: 7/1/1948 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	65.0	65.6	65.3	66.8	67.9	69.8	73.4	75.2	75.4	73.1	69.5	65.5	69.4
Average Min. Temperature (F)	44.8	46.4	49.1	52.0	56.4	59.6	63.5	64.7	62.6	56.8	49.5	44.6	54.2
Average Total Precipitation (in.)	1.91	1.73	1.75	0.76	0.15	0.06	0.02	0.06	0.16	0.40	1.13	1.17	9.30
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.

Max. Temp.: 93.2% Min. Temp.: 93.1% Precipitation: 98.7% Snowfall: 98.8% Snow

Depth: 98.6%

Check Station Metadata or Metadata graphics for more detail about data completeness.

and the statement of the company of

Western Regional Climate Center, wrcc@dri.edu

### NCDC 1971-2000 Monthly Normals

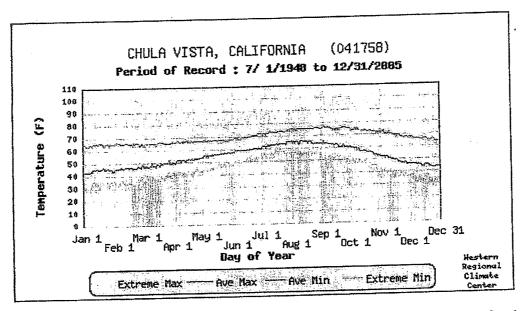
			1100		, <u>), '</u>	00 1/1	·	J					A
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Monthly
Mean Max. Temperature (F)	68.5	68.8	68.4	70.2	70.3	72.6	76.1	78.3	78.7	76.4	72.2	68.8	72.4
Highest Mean Max. Temperature (F)	72.9	73.4	73.7	74.0	74.6	78.7	81.2	81.7	83.6	82.8	79.0	74.2	83.6
Year Highest Occurred	1 <b>98</b> 6	1977	1997	1992	1997	1981	1984	1971	1997	1999	1976	1976	1997
Lowest Mean Max. Temperature (F)	64.0	65.2	62.4	65.6	64.4	67.5	72.0	75.2	74.1	72.0	67.8	63.6	62.4
Year Lowest Occurred	1982	1998	1999	1975	1998	1998	1991	1999	1986	2000	1985	1987	1999
Mean Temperature (F)	57.3	58.3	59.2	61.5	63.7	66.5	70.1	71.8	71.2	67.1	61.0	57.2	2 63.7
Highest Mean Temperature (F)	61.2	62.2	63.3	65.9	69.0	71.2	74.2	75.0	75.9	70.4	65.3	62.	8 75.9
Year Highest Occurred	1980	1995	1978	1992	1992	1981	1984	1992	1997	1987	1976	197	7 1997
Lowest Mean Temperature (F)	53.4	54.9	55.2	57.3	60.4	63.3	67.0	68.4	66.8	64.6	5 56.9	53.	1 53.1
Year Lowest Occurred	<b>197</b> 2	1985	1985	1975	1998	1999	1987	7 1975	1986	197	1 1994	4 198	7 1987
Mean Min Temperature (F)	461	47,5	50:0	52.8	3 57.1	60	64.(	) 65.	63.	7.57	7.49.	8 45	\$ A. 455:0
Highest Mean Min. Temperature (F)	51.9	53.4	1 53.8	3 57.8	8 63.6	63 <u>.</u> €	5 67.1	1 68.5	5 68.2	2 62.	0 53.	1 53	.4 68.5

### NCDC 1971-2000 Monthly Normals

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Monthly
Year Highest Occurred	1980	1995	1978	1992	1992	1981	1984	1992	1997	1987	1997	1977	1992
Lowest Mean Min. Temperature (F)	41.0	43.0	46.0	49.1	53.3	56.8	61.3	61.5	59.5	52.8	45.0	42.6	41.0
Year Lowest Occurred	1072	1985	1985		jūjų.	1071		<u>i</u> ÿ75	1986		24(01)	1987	1972
Mean Pecipitation (in.)	1 99 1 99	1299	2.07			Tijik	(1) (1)	0.68					0,95
Highest Precipitation (in.)	8.25	7.77	7.39	2.33	1.42	0.60	0.43	2.00	1.46	2.66	8.13	5.25	8.25
Year Hubest Occurred						1890	1911)		11:216				
Lowest Precipitation (in.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year Lawest Geografi						307. 307.		1999					, 1076
Heating Degree Days (F)	243.	194.	190.	126	. 91.	40.	8.	. 4.	8.	31.	. 138	. 248	. 1321.
Cooling Degree Days (F)	4.	. 5	. 10.	20	. 50.	83.	165.	. 214.	193.	95	. 18	. 5	s. 862.
							^				-		

Western Regional Climate Center, wrcc@dri.edu

### POR - Daily Temperature Averages and Extremes



- Extreme Max. is the maximum of all daily maximum temperatures recorded for the day of the year.

Ave. Max. is the average of all daily maximum temperatures recorded for the day of the year.

Ave. Min. is the average of all daily minimum temperatures recorded for the day of the year.

Extreme Min. is the minimum of all daily minimum temperatures recorded for the day of the year.

### SUMMER

History for San Diego Brown, California Friday, July 1, 2005 — View Current Conditions

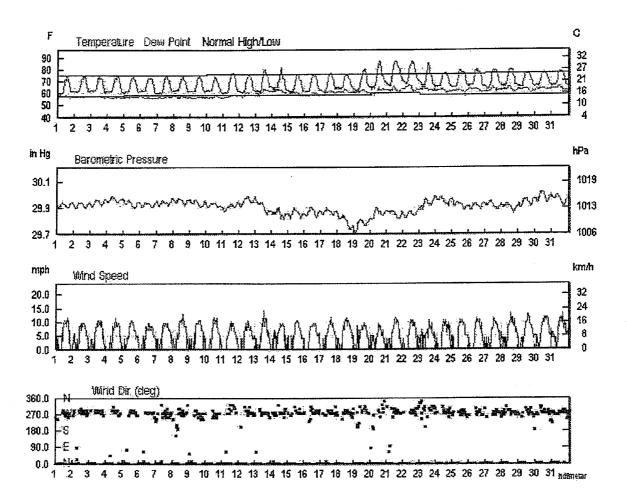
Date:	July	-	1	<b>-</b>	2005	<b>-</b>	Go	Airport Code:	Go
	d .	النسنسد	1	أننسن	3	اسمنب	-		

Recently Viewed Airport Codes: KSDM | KOKB

Daily Trip Planner Custom Weekly Montaly

« Previous Month			**	Monthly Summary Monte or July 105
	Max	Avg	Min	Sum
Temperature	<del></del>			
Max Temperature	89 °F / _31 °C	78 °F / 25 °C	<b>73</b> °F	/ <b>22</b> °C
Mean Temperature		69 °F / 20 °C	<b>65</b> °F.	/ 18 °C
Min Temperature	66 °F / _18 °C	61 °F / 15 °C	<b>57</b> °F	/ 13 °C
Degree Days	==		<del></del>	
Heating Degree Days (base 65)	_0	0	0	Ó
Cooling Degree Days (base 65)	<u>_</u> 11	4	Ó	121
Growing Degree Days (base 50)	_26	19	15	587
Dew Point	=		<del>- 1</del> 12 - 12	
Dew Point	66 °F / _18 °C	59 °F / 14 °C	<b>55</b> °F	/ 12 °C

Precipitation	<u></u>	-		
Precipitation	<b>0.07</b> in / <b>0.2</b> cm	0.00 in / 0.0 cm	0.00 i n / 0.0 c m	0.12 in / 0.32 cm
Snowdepth	-		-	
Vind		-		
Wind	14 mph / 23 km/h	2 mph / 3 km/h	<b>0</b> mph /	0 km/h
Gust Wind	18 mph / 29 km/h	17 mph / 27 km/h	16 mph	/ 26 km/h
Sea Level Pressure				
Sea Level Pressure	30.01 in /	29.91 in / 1012 hPa	<b>29.70</b> ir	n / <b>1006</b> hPa



### **FALL**

History for San Diego Brown, California Tuesday, October 22, 1996 — View Current Conditions Jump to Data:

							Go	ar r Madar	Go
Date:	October	<b>*</b>	22	<u> </u>	1996	_		Airport Code:	1

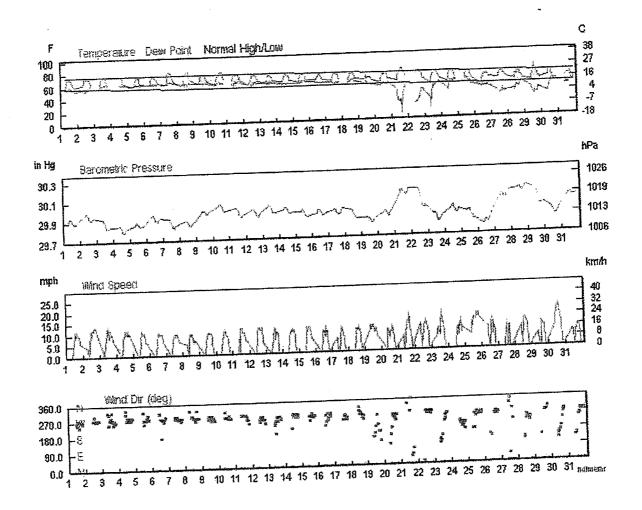
Recently Viewed Airport Codes: KSDM | KOKB

Daily	Weekly	<b>VIOLET</b>	Custom	Trip Planner
-------	--------	---------------	--------	--------------

« Previous Month			<i>v</i>	onthly Next ummary r Mont ctober 1.3
	Max	Avg	Min	Sum
Temperature			<u> </u>	
Max Temperature	82 °F / 27 °C	72°F/ 22°C	64 °F / 17	o.
Mean Temperature	70 °F / 21 °C	65 °F / 18 °C	57 °F / 13	°C
Min Temperature	64 °F / 17 °C	58 °F / 14 °C	48 °F / 8 °	S .
Degree Days			<u></u>	
Heating Degree Days (base 65)	8	1	0	37
Cooling Degree Days (base 65)	6	1	0	43
Growing Degree Days (base 50)	_20	15	7	479
Dew Point			<u></u>	
Dew Point	66 °F./ 18 °C	53 °F / 11 °C	7 °F / -13	°C

	400-			
Precipitation		-		
Precipitation	0.00 în / 0.0 cm	0.00 in / 0.0 cm	0.00 in / 0.0 cm	0.00 in / 0.00 cm
Snowdepth		_	-	-
Nind		-		
Wind	20 mph / 32 km/h	5 mph / 8 km/h	0 mph / 0 k	km/h
Gust Wind	25 mph / 40 km/h	25 mph / 40 km/h	25 mph / 4	0 km/h
Sea Level Pressure				
Sea Level Pressure	30.17 in / 1022 hPa		<b>29.77</b> in /	1008 hPa

....



# APPENDIX B FUEL MODELING



Description	Non-	native grassland Santa Ana
uel/Vegetation, Surface/Understory		
Fuel Model		3
Guel/Vegetation, Overstory		
Canopy Height	ft	3
Fuel Moisture		
Dead Fuel Moisture	%	2
Live Fuel Moisture	<b>%</b>	
Weather		
20-ft Wind Speed	mi/h	20
Wind Adjustment Factor		0.4
Wind Direction (from north)	deg	45
Air Temperature	oF	82
Fuel Shading from the Sun	%	0
Terrain		_
Slope Steepness	%	5
Aspect (from north)	deg	0
Ridge-to-Valley Elevation Difference	ft	0
Ridge-to-Valley Horizontal Distance	mi	
Spotting Source Location		
Fire		O F
Elapsed Time	h	0.5

### Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Heat per Unit Area (Btu/ft2) [SURFACE]

Fireline Intensity (Btu/ft/s) [SURFACE] (continued on next page)

### Input Worksheet (continued)

Flame Length (ft) [SURFACE]

Direction of Maximum Spread (from north) (deg) [SURFACE]

Surface Spread Distance (ch) [SURFACE]

Midflame Wind Speed (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Wind/Slope/Spread Direction Diagram [SURFACE]

Fire Characteristics Chart [SURFACE]

Area (ac) [SIZE]

Perimeter (ch) [SIZE]

Forward Spread Distance (ch) [SURFACE]

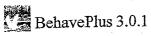
Spot Dist from Wind Driven Surface Fire (mi) [SPOT]

Probability of Ignition from a Firebrand (%) [IGNITE]

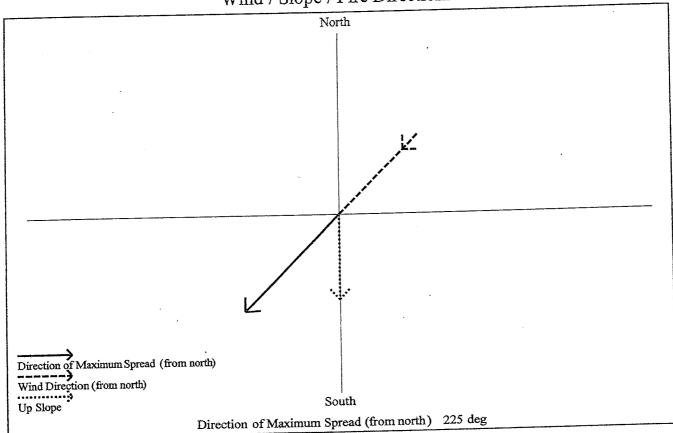
Notes	
1	

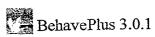
## Non-native grassland Santa Ana

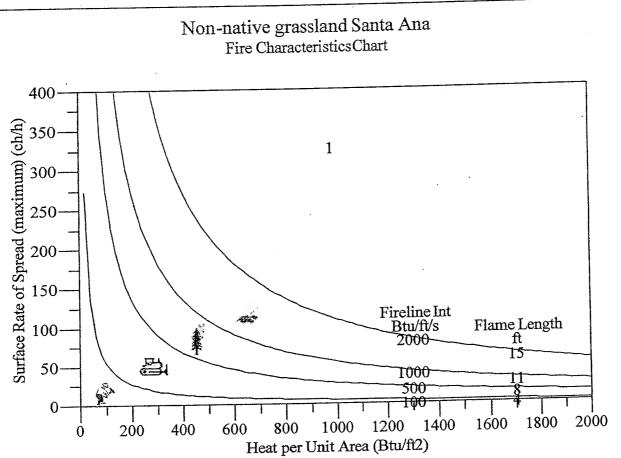
329.6 ch/h
980 Btu/ft2
5921 Btu/ft/s
<del>-</del> -
24.5 ft
<b>225</b> deg
164.8 ch
8.0 mi/h
0.4
752.9 ac
378 ch
164.8 ch
0.9 mi
100 %



### Non-native grassland Santa Ana Wind / Slope / Fire Directions





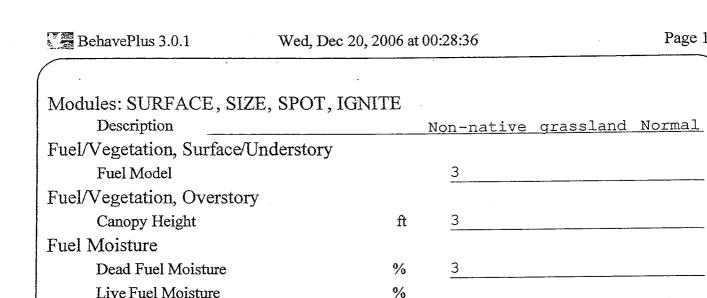


### Discrete Variable Codes Used Non-native grassland Santa Ana

Fuel Model

3

Tall grass (S)



### Weather

20-ft Wind Speed

Air Temperature

Wind Adjustment Factor

Wind Direction (from north)

An remperature	OI	
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	0
Aspect (from north)	deg	0
Ridge-to-Valley Elevation Difference	ft	0
Ridge-to-Valley Horizontal Distance	mi	
Spotting Source Location		

### Run Option Notes

Elapsed Time

Fire

Calculations are only for the direction of maximum spread [SURFACE].

mi/h

deg

 $\alpha F$ 

h

0.4

0.5

225

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

### Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Heat per Unit Area (Btu/ft2) [SURFACE]

Fireline Intensity (Btu/ft/s) [SURFACE]

(continued on next page)

### Input Worksheet (continued)

Flame Length (ft) [SURFACE]

Direction of Maximum Spread (from north) (deg) [SURFACE]

Surface Spread Distance (ch) [SURFACE]

Midflame Wind Speed (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Wind/Slope/Spread Direction Diagram [SURFACE]

Fire Characteristics Chart [SURFACE]

Area (ac) [SIZE]

Perimeter (ch) [SIZE]

Forward Spread Distance (ch) [SURFACE]

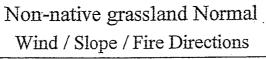
Spot Dist from Wind Driven Surface Fire (mi) [SPOT]

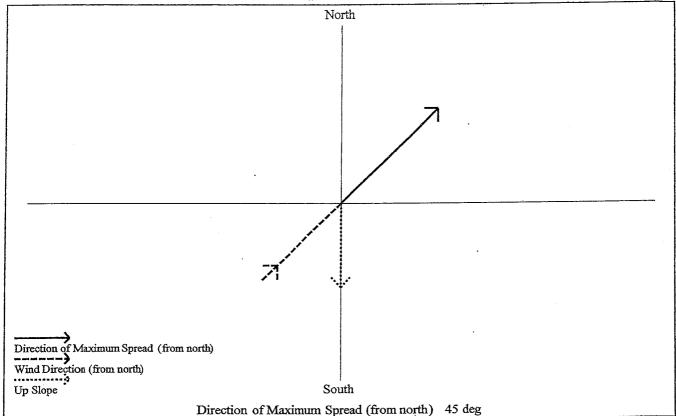
Probability of Ignition from a Firebrand (%) [IGNITE]

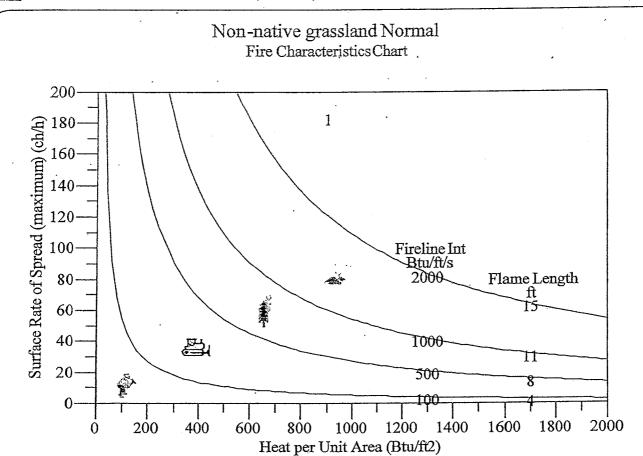
Notes				
		 •	 	
			•	

### Non-native grassland Normal

Surface Rate of Spread (maximum)	184.3	ch/h
Heat per Unit Area	900	Btu/ft2
Fireline Intensity	3041	Btu/ft/s
Flame Length	18.0	ft
Direction of Maximum Spread (from north)	45	deg
Surface Spread Distance	92.1	ch
Midflame Wind Speed	5.6	mi/h
Wind Adjustment Factor	0.4	
Area	304.9	ac
Perimeter	224	ch
Forward Spread Distance	92.1	ch
Spot Dist from Wind Driven Surface Fire	0.5	mi
Probability of Ignition from a Firebrand	87	%





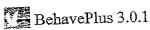


Discrete Variable Codes Used Non-native grassland Normal

Fuel Model

3

Tall grass (S)



Modules: SURFACE, SIZE, SPOT, IGN Description	Co	oastal Sage Scrub Santa And
Fuel/Vegetation, Surface/Understory		
Fuel Model		SCAL18
Fuel/Vegetation, Overstory	ft	4
Canopy Height	10	
Fuel Moisture	%	2
Dead Fuel Moisture	%	50
Live Fuel Moisture	%	30
Weather	,	20
20-ft Wind Speed	mi/h	20
Wind Adjustment Factor		0.5
Wind Direction (from north)	deg	45
Air Temperature	oF	82
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	0
Aspect (from north)	deg	0
Ridge-to-Valley Elevation Difference	ft	0
Ridge-to-Valley Horizontal Distance	mi	
Spotting Source Location		
Fire Elapsed Time	h	0.5

### Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

### Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Heat per Unit Area (Btu/ft2) [SURFACE]

Fireline Intensity (Btu/ft/s) [SURFACE]

(continued on next page)

#### Input Worksheet (continued)

Flame Length (ft) [SURFACE]

Direction of Maximum Spread (from north) (deg) [SURFACE]

Surface Spread Distance (ch) [SURFACE]

Midflame Wind Speed (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Wind/Slope/Spread Direction Diagram [SURFACE]

Fire Characteristics Chart [SURFACE]

Area (ac) [SIZE]

Perimeter (ch) [SIZE]

Forward Spread Distance (ch) [SURFACE]

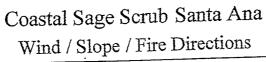
Spot Dist from Wind Driven Surface Fire (mi) [SPOT]

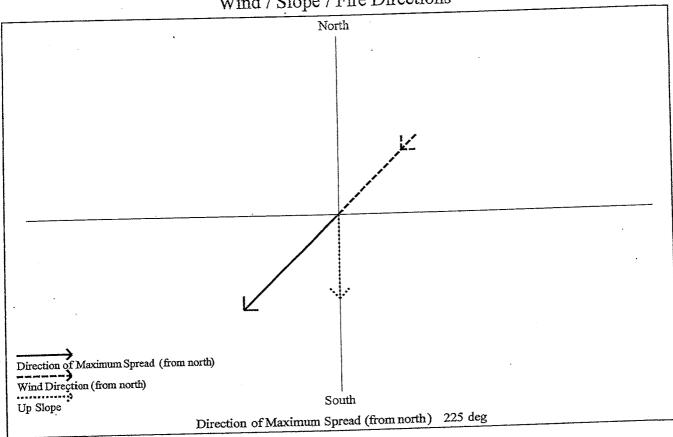
Probability of Ignition from a Firebrand (%) [IGNITE]

Notes	
	•

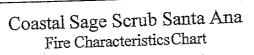
# Coastal Sage Scrub Santa Ana

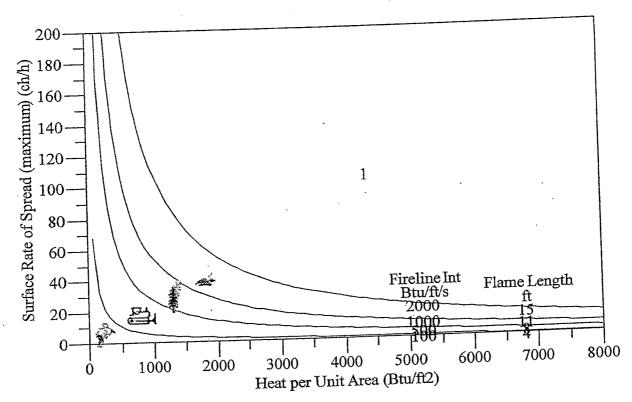
Surface Rate of Spread (maximum)	107.5	ch/h
Heat per Unit Area	4337	Btu/ft2
Fireline Intensity	8550	Btu/ft/s
Flame Length	29.0	ft
Direction of Maximum Spread (from north)	225	deg
Surface Spread Distance	53.8	ch
Midflame Wind Speed	10.0	mi/h
Wind Adjustment Factor	0.5	
Area	67.7	ac
Perimeter	120	ch
Forward Spread Distance	53.8	ch
Spot Dist from Wind Driven Surface Fire	1.0	mi
Probability of Ignition from a Firebrand	100	%

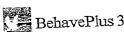












# Discrete Variable Codes Used Coastal Sage Scrub Santa Ana

Fuel Model

Sage / Buckwheat SCAL18

Modules: SURFACE, SIZE, SPOT, IGI	NILE	Coastal Sage Scrub Normal
Description		Coastal Bage Dollas Ross
Fuel/Vegetation, Surface/Understory		CCRT 10
Fuel Model		SCAL18
Fuel/Vegetation, Overstory		
Canopy Height	ft	4
Fuel Moisture		
Dead Fuel Moisture	%	3
Live Fuel Moisture	%	50
Weather		
20-ft Wind Speed	mi/h	14
Wind Adjustment Factor		0.5
Wind Direction (from north)	deg	225
Air Temperature	oF	82
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	0
Aspect (from north)	deg	0
Ridge-to-Valley Elevation Difference	ft	0
Ridge-to-Valley Horizontal Distance	$\mathbf{m}\mathbf{i}$	
Spotting Source Location		
Fire		
Elapsed Time	h	0.5

## Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

## Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Heat per Unit Area (Btu/ft2) [SURFACE]

Fireline Intensity (Btu/ft/s) [SURFACE]

(continued on next page)

#### Input Worksheet (continued)

Flame Length (ft) [SURFACE]

Direction of Maximum Spread (from north) (deg) [SURFACE]

Surface Spread Distance (ch) [SURFACE]

Midflame Wind Speed (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Wind/Slope/Spread Direction Diagram [SURFACE]

Fire Characteristics Chart [SURFACE]

Area (ac) [SIZE]

Motor

Perimeter (ch) [SIZE]

Forward Spread Distance (ch) [SURFACE]

Spot Dist from Wind Driven Surface Fire (mi) [SPOT]

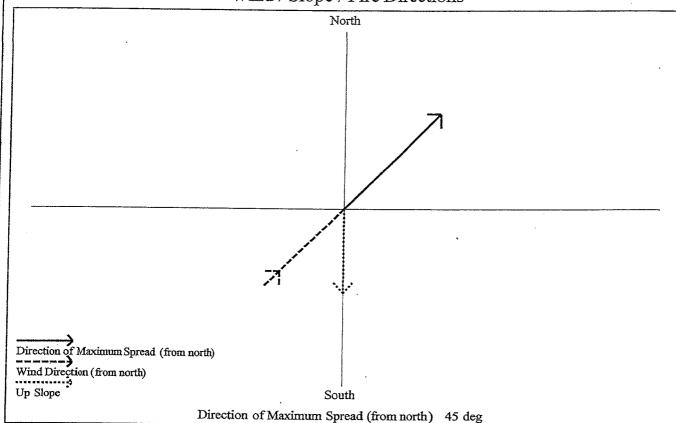
Probability of Ignition from a Firebrand (%) [IGNITE]

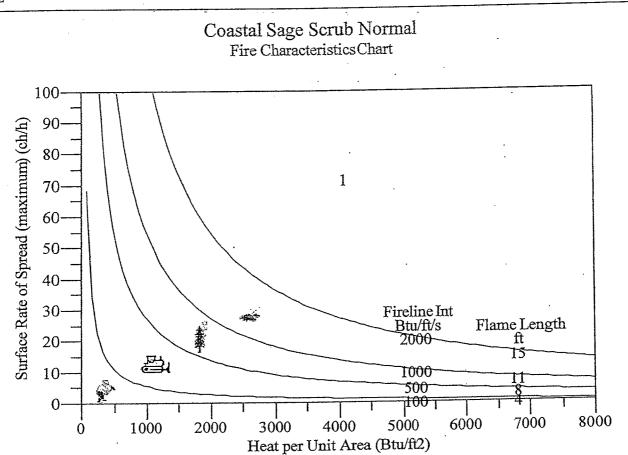
140162			 	

# Coastal Sage Scrub Normal

Surface Rate of Spread (maximum)	72.3	ch/h
Heat per Unit Area	4065	Btu/ft2
Fireline Intensity	5389	Btu/ft/s
Flame Length	23.4	ft
Direction of Maximum Spread (from north)	45	deg
Surface Spread Distance	36.2	ch
Midflame Wind Speed	7.0	mi/h
Wind Adjustment Factor	0.5	
Area	40.0	ac
Perimeter	85	ch
Forward Spread Distance	36.2	ch
Spot Dist from Wind Driven Surface Fire	0.7	mi
Probability of Ignition from a Firebrand	87	%

# Coastal Sage Scrub Normal Wind / Slope / Fire Directions





# Discrete Variable Codes Used Coastal Sage Scrub Normal

Fuel Model

SCAL 18 Sage / Buckwheat

# APPENDIX C SUGGESTED PLANTS FOR A DEFENSIBLE SPACE

# SUGGESTED PLANT LIST FOR A DEFENSIBLE SPACE

BOTANICAL NAME	COMMON NAME	Climate Zone
TREES		
INCLO	PRINCEDO DA DE LA CALLANDA DE LA CAL	
Acer	RECEIVED	
platanoides	Norway Maple	M
rubrum	Red Maple	M
saccharinum	Silver Maple	M
saccarum	Sugar Maple	M
macrophyllum	Big Leaf Maple	C/ (R)
Alnus rhombifolia	White Alder	C/I/M (R)
Arbutus		
unedo	Strawberry Tree	All zones
Archontophoenix		_
cunninghamiana	King Palm	C
Arctostaphylos spp.**	Manzanita	C/I/D
Brahea		C/D
armata	Blue Hesper Palm	C/D C/D
edulis	Guadalupe Palm	U/U
	CONTRACTOR OF THE PROPERTY OF	and the state of t
	O	C/I/D
Ceratonia siliqua Cerdidium floridum	Carob Blue Palo Verde	D
Cerdidium nondum  Cercis occidentalis**	Western Redbud	C/I/M
Cornus	Westelli Medbud	
nuttallii	Mountain Dogwood	I/M
stolonifera	Redtwig Dogwood	I/M
Eriobotrya	Trouting Dogness	C/I/D
japonica	Loquat	С
Erythrina caffra	Kaffirboom Coral Tree	[ I/M
Gingko biloba "Fairmount"	Fairmount Maidenhair Tree	I/D/M
Gleditisia triacanthos	Honey Locust	
Juglans	- Triples	
californica	California Walnut	C/I
hindsii	California Black Walnut	I/D/M
Lagerstroemia indica	Crape Myrtle	
Ligustrum lucidum	Glossy Privet	C/I/M
Liquidambar styraciflua	Sweet Gum	
Liriodendron tulipifera	Tulip Tree	Ċ
Lyonothamnus floribundus		C/I/D
ssp. Asplenifolius	Fernleaf Catalina Ironwood	
Melaleuca spp.	Melaleuca	
Parkinsonia aculeate	Mexican Palo Verde	
	TOWNS AND	economic .
Pistacia	Chinese Pistache	-
chinensis	Pistachio Nut	C/I/D
Chillensis	risidenio ivui	

		1
vera	Pistachio Nut	i
Pittosporum		
phillyraeoides	Willow Pittosporum	C/I/D
viridiflorum	Cape Pittosporum	C/I
Platanus		
acerifolia	London Plane Tree	All zones
racemosa**	California Sycamore	C/I/M
Populus	Jamonna oyoumo.	
alba	White Poplar	D/M
fremontii**	Western Cottonwood	
	Black Cottonwood	i/M
trichocarpa	PIACK CONTOURNOOD	,
Prunus		М
xblireiana 	Flowering Plum	C
caroliniana	Carolina Laurel Cherry	0 0
ilicifolia**	Hollyleaf Cherry	C
lyonii**	Catalina Cherry	3 31
serrulata 'Kwanzan'	Flowering Cherry	M
yedoensis 'Akebono'	Akebono Flowering Cherry	M
Quercus		
agrifolia**	Coast Live Oak	C/I
engelmannii	Engelmann Oak	
** suber	Cork Oak	C/I/D
Rhus		
lancea**	African Sumac	C/I/D
Salix spp.**	Willow	All zones (R)
Tristania conferta	Brisbane Box	C/I
Ulmus		
parvifolia	Chinese Elm	I/D
pumila	Siberian Elm	C/M
Umbellularia californica**	California Bay Laurel	C/I

•

Agave Century Plant D americana Century Plant D deserti Shawis Century Plant D shawi** Amorpha fruticosa** False Indigobush	A TO THE PROPERTY OF THE PROPE
americana Century Plant D deserti Shawis Century Plant D shawi**	A CARLO MARIA DE CARLO DE CAR
deserti Shawis Century Plant D shawi**	NCIDO UKROPANTKIRA KATALA, PARA PARA PARA PARA PARA PARA PARA PA
shawi**	ALEXANDER CONTRACTOR AND
Amorpha fruticosa**  False Indigobush	
Arbutus	1
menziesii** Madrone C/I	
Arctostaphylos spp.** Manzanita C/I/D	AND AND COLUMN
Atriplex**	
canescens Hoary Saltbush	
lentiformis Quail Saltbush D	
Baccharis**	
glutinosa Mule Fat C/I/D pilularis Covote Bush C/I/D	
printing good business and a second good good business and a second good good good good good good good g	
Ceanothus spp.**  California Lilac  Cistus spp.  Collination	No entropy
Cristus spp. Rockrose Conno	respination.
Comarostaphylis**	
diversifolia Summer Holly C	,
Convolvulus cneorum Bush Morning Glory C/I/M	
Dalea	
orcuttii Orcutt's Delea D	
spinosa** Smoke Tree I/D	
Elaeagnus	
pungens Silverberry C/I/M	1
Encelia**	
californica Coast Sunflower C/I	
farinose White Brittlebush D/I	
Eriobotrya	
deflexa Bronze Loquat C/I	
Eriophyllum	
confertiflorum** Golden Yarrow C/I	
staechadifolium Lizard Tail C	
Escallonia spp. Escallonia C/I Feijoa sellowiana Pineapple Guava C/I/D	
Fouqueria splendens Ocotillo D Fremontodendron**	
californicum Flannelbush I/M	
mexicanum Southern Flannelbush I	
Galvezia	
juncea Baja Bush-Snapdragon C	•
speciosa Island Bush-Snapdragon C	
islatiu busti-Sitaputagoti	
Garrya	
elliptica Coast Silktassel C/I	
flavescens**  Ashv Silktassal	

		1/8/4
Heteromeles arbutifolia**	Ashy Silktassel	I/M
Lantana spp.	Toyon	C/I/M C/I/D .
Lotus scoparius	Lantana	8 #
Mahonia spp.	Deerweed	C/I
	Barberry	C/I/M
Malacothamnus		
clementinus		
CANADA CA	San Clemente Island Bush Mallow	C
fasciculatus**		
NA PARAMETER AND A PARAMETER A	Mesa Bushmallow	C/I
Melaleuca spp.	,	
Mimulus spp.**	Melaleuca	C/I/D
Nolina	Monkeyflower	C/I (R)
parryi	-	
parryi ssp. wolfii	Parry's Nolina	
Photinia spp.	Wolf's Bear Grass	D
Pittosporum	Photinia	All Zones
crassifolium		01/1
rhombifolium		CI/I
tobira 'Wheeleri'	Queensland Pittosporum	C/I
undulatum	Wheeler's Dwarf	C/I/D
viridiflorum	Victorian Box	C/I
Plumbago auriculata	Cape Pittosporum	C/I C/I/D
Prunus	Cape Plumbago	CND
caroliniana		
ilicifolia**	Carolina Laurel Cherry	C
lyonii**	Hollyleaf Cherry	C
Puncia granatum	Catalina Cherry	C/I/D
Pyracantha spp.	Pomegranate	All Zones
Quercus	Firethorn	All ZUIIC3
dumosa**		C/I
Rhamus	Scrub Oak	
alaternus		C/I
californica**	Italian Blackthorn	C/I/M
Rhaphiolepis spp.	Coffeeberry	C/I/D
Rhus	Rhaphiolepis	
integrifolia**		C/I
laurina	Lemonade Berry	C/I
lentii	Laurel Sumac	C/D
ovata**	Pink-Flowering Sumac	I/M
trilobata**	Sugarbush	
Ribes	squawbush	u <u>lladenan</u>
viburnifolium	1	C/I
speciosum**	Evergreen Currant	
Romneya coulteri	Fuschia-Flowering Gooseberry	
Rosa	Matilija Poppy	SS I
californica**	N. Control of the Con	•
minutifolia		i .

Sambucus spp.** Symphoricarpos mollis** Syringa vulgaris Tecomaria capensis Teucrium fruticans Toxicodendron**	California Wild Rose Baja California Wild Rose Sage Elderberry Creeping Snowberry Lilac Cape Honeysuckle Bush Germander  Poison Oak Lilac Verbena Shiny Xylosma  Mojave Yucca Foothill Yucca	C/I C/I All Zones C/I/M C/I M C/I/D C/I I/M C C I
--	--	---

GROUNDCOVERS		ниничения
Achillea**	Yarrow	All Zones
Achillea Aptenia cordifolia	Apteria	C
Arctostaphylos spp.**	Manzanita	C/I/D
Baccharis**		
pilularis	Coyote Bush	C/I/D
Ceanothus spp.**	California Lilac	C/I/M
Cerastium tomentosum	Snow-in-Summer	All Zones
Coprosma kirkii	Creeping Coprosma	C/I/D
Cotoneaster spp.	Redberry	All Zones
Drosanthemum hispidum	Rosea Ice Plant	C/I
Dudleya		
brittonii	Brittonis Chalk Dudleya	C
pulverulenta**	Chalk Dudleya	
virens	Island Live Fore-ever	All Zones
Eschscholzia californica**	California Poppy	All Zolles
Euonymus fortunei	ALC LANCONON	M
'Carrierei'	Glossy Winter Creeper	M
'Coloratus'	Purple-Leaf Winter Creeper Coast Barrel Cactus	C
Ferocactus viridescens**	Blanket Flower	All Zones
Gaillardia grandiflora	Gazania	C/I
Gazania spp.	Sunrose	All Zones
Helianthemum spp.**	Lantana	C/I/D
Lantana spp. Lasthenia	Latitatia	
californica**	Common Goldfields	1
glabrata	Coastal Goldfields	C
Lupinus spp.**	Lupine	C/I/M
Myoporum spp.	Myoporum	C/I
Pyracantha spp.	Firethorn	All zones
Rosmarinus officinalis	Rosemary	C/I/D
Santolina		All Zones
chamaecyparissus	Lavender Cotton	All Zones
virens	Santolina	C/I
Trifolium frageriferum	O'Connor's Legume	0/1
Verbena		All Zones
rigida	Verbena	
Viguiera laciniata**	San Diego Sunflower	<b>.</b>
Vinca	Dwarf Periwinkle	M .
minor	DWall reliminate	NAMES OF THE OWNER OF THE OWNER.

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			<b>1</b>
VINES			
ининический применентири приме	Antigonon leptopus Distictis buccinatoria Keckiella cordifolia**	San Miguel Coral Vine Blood-Red Trumpet Vine Heart-Leaved Penstemon	C/I C/I/D C/I
мын <b>малук</b> ти), инпинини	Lonicera japonica 'Halliana' subspicata**	Hall's Honeysuckle Chaparral Honeysuckle	All Zones C/I
THE STATE OF THE S	Solanum jasminoides	Potato Vine	C/I/D

	AND STANDARD	uudu
PERENNIALS		
Coreopsis gigantean grandiflora maritime verticillata Heuchera maxima Iris douglasiana** Iva hayesiana** Kniphofia uvaria Lavandula spp. Limonium californicum var. mexicanum perezii Oenothera spp. Penstemon spp.** Satureja douglasii	Giant Coreopsis Coreopsis Sea Dahlia Coreopsis Island Coral Bells Douglas Iris Poverty Weed Red-Hot Poker Lavender Coastal Statice Sea Lavender Primrose Penstemon Yerba Buena	C All Zones C C/I C/I C/M C/I C/M All Zones  C C/I C/I/M All Zones
Sisyrinchium bellum californicum	Blue-Eyed Grass Golden-Eyed Grass	C/I C
Solanum xantii	Purple Nightshade	C/I
Zauschneria** californica cana	California Fuschia Hoary California Fuschia Catalina Fuschia	C/I C/I
'Catalina'	- Catanna i doonia	

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<b>#</b>		#	
=		#	= { <sup>-</sup> /{/}\//
=	Lupinus spp.**	# Lunino	# C111141 #
=	Luninua ann ^^	Lupine	
= =	LHORIUS SOD.	EUDITO	SHEET STANFALL STANFA
=	Lupinao opp.		
=		Annual Control	•

# APPENDIX D UNDESIRABLE PLANT LIST

#### UNDESIRABLE PLANT LIST

The following species are highly flammable and should be avoided when planting within the first 50 feet adjacent to a structure. The plants listed below are more susceptible to burning, due to rough or peeling bark, production of large amounts of litter, vegetation that contains oils, resin, wax, or pitch, large amounts of dead material in the plant, or plantings with a high dead to live fuel ratio. Many of these species, if existing on the property and adequately maintained (pruning, thinning, irrigation, litter removal, and weeding), may remain as long as the potential for spreading a fire has been reduced or eliminated.

potential for spreading a fire has been re	duced or eliminated.
BOTANICAL NAME	COMMON NAME
Abies species	Fir Trees
Acacia species	Acacia (trees, shrubs, groundcovers)
Adenostoma sparsifolium**	Red Shanks
Adenostoma fasciculatum**	Chamise
Agonis juniperina	Juniper Myrtle
Araucaria species	Monkey Puzzle, Norfolk Island Pine
Artemesia californica**	California Sagebrush
Bambusa species	Bamboo
Cedrus species	Cedar
Chamaecyparis species	False Cypress
Coprosma pumila	Prostrate Coprosma
Cryptomeria japonica	Japanese Cryptomeria
Cupressocyparis leylandii	Leylandii Cypress
Cupressus forbesii**	Tecate Cypress
<u>Cupressus glabra</u>	Arizona Cypress
Cupressus sempervirens	Italian Cypress
<u>Dodonea viscosa</u>	Hopseed Bush
Eriogonum fasciculatum**	Common Buckwheat
Eucalyptus species	Eucalyptus
Heterotheca grandiflora**	Telegraph Plant
<u>Juniperus species</u>	Junipers
<u>Larix species</u>	Larch
<u>Lonicera japonica</u>	Japanese Honeysuckle
<u>Miscanthus species</u>	Eulalia Grass
<u>Muehlenbergia species</u> **	Deer Grass
<u>Palmae species</u>	Palms
<u>Picea species</u>	Spruce Trees
Pickeringia Montana**	Chaparral Pea
<u>Pinus species</u>	Pines
<u>Podocarpus species</u>	Fern Pine
<u>Pseudotsuga menziesii</u>	Douglas Fir
Rosmarinus species	Rosemary
Salvia mellifera**	Black Sage
<u>Taxodium species</u>	Cypress
Taxus species	Yew
Thuja species	Arborvitae
Tsuga species	Hemlock
Urtica urens**	Burning Nettle

#### San Diego County native species

<u>References</u>: Gordon, H. White, T.C. 1994. Ecological Guide to Southern California Chaparral Plant Series. Cleveland National Forest.

Willis, E. 1997. San Diego County Fire Chief's Association. Wildland/Urban Interface Development Standards

City of Oceanside, California. 1995. Vegetation Management. Landscape Development Manual. Community Services Department, Engineering Division.

City of Vista, California 1997. Undesirable Plants. Section 18.56.999. Landscaping Design, Development and Maintenance Standards.

www.bewaterwise.com. 2004. Fire-resistant California Friendly Plants.

<u>www.ucfpl.ucop.edu</u>. 2004. University of California, Berkeley, Forest Products Laboratory, College of Natural Resources. Defensible Space Landscaping in the Urban/Wildland Interface. A Compilation of Fire Performance Ratings of Residential Landscape Plants.

County of Los Angeles Fire Department. 1998. Fuel Modification Plan Guidelines. Appendix I, Undesirable Plant List, and Appendix II, Undesirable Plant List.

# APPENDIX E CAL EPPC LIST

The Caleppe List:

# Exotic Pest Plants of Greatest Ecological Concern in California

October, 1999

he CalEPPC list is based on information submitted by our members and by land managers, botanists and researchers throughout the state, and on published sources. The list highlights non-native plants that are serious problems **in wildlands** (natural areas that support native ecosystems, including national, state and local parks, ecological reserves, wildlife areas, national forests, BLM lands, etc.).

#### List categories include:

**List A:** Most Invasive Wildland Pest Plants; documented as aggressive invaders that displace natives and disrupt natural habitats. Includes two sub-lists; List A-1: Widespread pests that are invasive in more than 3 Jepson regions (see page 3), and List A-2: Regional pests invasive in 3 or fewer Jepson regions.

**List B:** Wildland Pest Plants of Lesser Invasiveness; invasive pest plants that spread less rapidly and cause a lesser degree of habitat disruption; may be widespread or regional.

**Red Alert:** Pest plants with potential to spread explosively; infestations currently small or localized. If found, alert CalEPPC, County Agricultural Commissioner or California Department of Food and Agriculture.

**Need More Information:** Plants for which current information does not adequately describe nature of threat to wildlands, distribution or invasiveness. Further information is requested from knowledgeable observers.

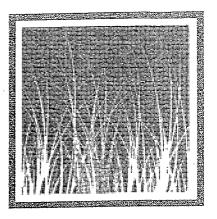
**Annual Grasses:** New in this edition; a preliminary list of annual grasses, abundant and widespread in California, that pose significant threats to wildlands. Information is requested to support further definition of this category in next List edition.

**Considered But Not Listed:** Plants that, after review of status, do not appear to pose a significant threat to wildlands.

# Plants that fall into the following categories are not included in the List:

Plants found mainly or solely in disturbed areas, such as roadsides and agricultural fields.

Plants that are established only sparingly, with minimal impact on natural habitats.



#### 1999 List Review Committee:

Dr. Lars W.J. Anderson, Research Leader U.S. Dept. of Agriculture-ARS Aquatic Weed Research Lab.

Dr. Joe DiTomaso, Extension Weed Ecologist Weed Science Program Department of Vegetable Crops University of California, Davis

Dr. G. Fred Hrusa, Senior Plant Systematist Plant Pest Diagnostics Center California Department of Food & Agriculture

Dr. Marcel Rejmanek, Professor of Plant Ecology Section of Evolution and Ecology University of California, Davis

#### CalEPPC List Committee:

Ann Howald, Instructor Santa Rosa Junior College

Dr. John Randall, Invasive Weed Specialist The Nature Conservancy

Jake Sigg, President
California Native Plant Society

Ellie Wagner, Botanist California Dept. of Transportation

Peter Warner, Restoration Coordinator Golden Gate National Parks Association

The CaIEPPC list is updated regularly Please use the form provided to send comments, suggestions or new information to: Peter Warner, 555 Magnolia Avenue, Petaluma, CA, 94952-2080, or via email at peterjwarner@earthlink.net

Thanks to all those who submitted comments for the 1999 list.

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#### List A-1: Most Invasive Wildland Pest Plants; Widespread

Latin Name	Çommon Name	Habitats of Concern and Other Comments	Distribution <sup>2</sup>
Ammophila arenaria	European beach grass	Coastal dunes	SCo,CCo,NCo
Arundo donax	giant reed, arundo	Riparian areas	cSNF,CCo,SCo,SnGb.D,GV
· Bromus tectorum	cheat grass, downy brome	Sagebrush, pinyon-juniper, other desert communities; increases fire frequency	GB,D
Carpobrotus edulis	iceplant, sea fig	Many coastal communities, esp. dunes	SCo,CCo,NCo,SnFrB
Centaurea solstitialis <sup>C</sup>	yellow starthistle	Grasslands	CA-FP (uncommon in SoCal)
Cortaderia jubata	Andean pampas grass, jubatagrass	Horticultural; many coastal habitats, esp. disturbed or exposed sites incl. logged areas	NCo,NCoRO,SnFrB, CCo,WTR,SCo
Cortaderia selloana	pampas grass	Horticultural; coastal dunes, coastal scrub, Monterey pine forest, riparian, grasslands; wetlands in ScV; also on serpentine	SnFrB,SCo,CCo,ScV
Cynara cardunculus <sup>B</sup>	artichoke thistle	Coastal grasslands	CA-FP, esp. CCo,SCo
Cytisus scoparius <sup>C</sup>	Scotch broom	Horticultural; coastal scrub, oak woodlands, Sierra foothills	NW,CaRF,SNF,GV, SCo,CW
Eucalyptus globulus	Tasmanian blue gum	Riparian areas, grasslands, moist slopes	NCoRO,GV,SnFrB, CCo,SCoRO,SCo,nChI
Foeniculum vulgare	wild fennel	Grasslands; esp. SoCal, Channel Is.; the cultivated garden herb is not invasive	CA-FP
Genista monspessulana <sup>c</sup>	French broom	Horticultural; coastal scrub, oak woodlands, grasslands	NCoRO,NCoRI,SnFrB, CCo,SCoRO,sChI,WTR,PR
Lepidium latifolium <sup>B</sup>	perennial pepperweed, tall whitetop	Coastal, inland marshes, riparian areas, wetlands, grasslands; potential to invade montane wetlands	CA (except KR,D)
Myriophyllum spicatum	Eurasian watermilfoil	Hörticultural; lakes, ponds, streams, aquaculture	SnFrB,SnJV,SNH(?); prob. CA
Pennisetum setaceum	fountain grass	Horticultural; grasslands, dunes, desert canyons; roadsides	Deltaic GV,CCo,SCo, SnFrB
Rubus discolor	Himalayan blackberry	Riparian areas, marshes; oak woödlands	CA-FP
Senecio mikanioides (=Delairea odorata)	Cape ivy, German ivy	Coastal, riparian areas, also SoCal (south side San Gabriel Mtns.)	SCo,CCo,NCo,SnFrB,SW
Taeniatherum caput-medusae <sup>C</sup>	medusa-head .	Grasslands, particularly alkaline and poorly drained areas	NCoR,CaR,SNF,GV,SCo
Tamarix chinensis, T. gallica, T. parviflora & T. ramosissima	tamarisk, salt cedar	Desert washes, riparian areas, seeps and springs	SCo,D,SnFrB,GV,sNCoR, sSNF,Teh,SCoRI,SNE, WTR
1. ramosissima Ülex europaeus <sup>B</sup>	gorse	North, central coastal scrub, grasslands	NCo,NCoRO,CaRF, n&cSNF,SnFrB,CCo

#### Noxious Weed Ratings

- F: Federal Noxious Weed, as designated by the USDA; targeted for federally-funded prevention; eradication or containment efforts.
- A: CA Dept. of Food & Agriculture, on "A" list of Noxious Weeds; agency policies call for eradication, confainment or entry refusal.
- B: CA Dept. of Food & Agriculture, on "B" list of Noxious Weeds; includes species that are more widespread, and therefore more difficult to contain; agency allows country Agricultural Commissioners to decide if local eradication or containment is warranted.
- C: CA Dept. of Food & Agriculture, on "C" list of Noxious Weeds; includes weeds that are so widespread that the agency does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.
- Q: CA Dept. of Food & Agriculture's designation for temporary "A" rating pending determination of a permanent rating.

For most species nomenclature follows The Jepson Manual: Higher Plants of California (Hickman, J., Ed., 1993).

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## List A-2: Most Invasive Wildland Pest Plants; Regional

Latin Name	Common Name	Habitats of Concern and Other Comments	Distribution <sup>2</sup>
Ailanthus altissima	tree of heaven	Riparian areas, grasslands, oak woodlands, esp. GV, SCo	CA-FP
Atriplex semibaccata	Australian saltbush	SoCal, coastal grasslands, scrub, "high marsh" of coastal salt marshes	CA (except CaR,c&sSN)
Brassica tournefortii	Moroccan or African mustard	Washes, alkaline flats, disturbed areas in Sonoran Desert	SW,D
Bromus madritensis ssp. rubens	red brome	Widespread; contributing to SoCal scrub, desert scrub type conversions; increases fire frequency	CA
Cardaria draba <sup>8</sup>	white-top, hoary cress	Riparian areas, marshes of central coast; also ag. lands, disturbed areas	Problem only in CCo
Conicosia pugioniformis	narrow-leaved iceplant, roundleaf iceplant	Coastal dunes, sandy soils near coast; best documented in San Luis Obispo and Santa Barbara cos.	CCo
Cotoneaster pannosus, C. lacteus	cotoneaster	Horticultural; many coastal communities; esp. North Coast, Big Sur; related species also invasive	CCo,SnFrB,NW
Cytisus striatus	striated broom	Often confused with C. scoparius; coastal scrub, grassland	SnFrB,CCo,SCo,PR
Egeria densa	Brazilian waterweed	Streams, ponds, sloughs, lakes; Sacramento-San Joaquin Delta	n&sSNF,SnJV,SnFrB, SnJt,SNE
Ehrharta calycina	veldt grass	Sandy soils, esp. dunes; rapidly spreading on central coast	CCo,SCoRO,WTR
Eichhornia crassipes	water hyacinth	Horticultural; established in natural waterways, esp. troublesome in Sacramento-San Joaquin Delta	GV,SnFrB,SCo,PR
Elaeagnus angustifolia	Russian olive	Horticultural; interior riparian areas	SnJV,SnFrB,SNE,DMoj
Euphorbia esula^	leafy spurge	Rangelands in far no. CA, also reported from Los Angeles Co.	eKR,NCo,CaR,MP,SCo
Ficuș carica	edible fig	Horticultural; Central Valley, foothill, South Coast and Channel Is. riparian woodlands	nSNF,GV,SnFrB,SCo
Lupinus arboreus	bush lupine	Native to SCo, CCo; invasive only in North Coast dunes	SCo,CCo,NCo
Mentha pulegium	pennyroyal	Santa Rosa Plain (Sonoma Co.) and Central Valley vernal pools; wetlands elsewhere	NW,GV,CWSCo
Myoporum laetum	myoporum	Horticultural; coastal riparian areas in SCo	SCo,CCo
Saponaria officinalis	bouncing bet	Horticultural; meadows, riparian habitat in SNE, esp. Mono Basin	NW,CaRH,riSNF,SnFrB, SCoRO,SCo,PR,MP,SNE, GV
Spartina alterniflora	Atlantic or smooth cordgrass	S.F. Bay salt marshes; populations in Humboldt Bay believed extirpated	CCo(shores of S.F. Bay)

# 2Distribution by geographic subdivisions per the Jepson Manual

CA=California Experience		Sev=Sacramento vansy
CA-FP=California Floristic Province	KR=Klamath Ranges	SnJV=San Joaquin Valley
CaR≒Cascade Ranges	MP=Modoc Plateau	SN≅Siema Nevada
CaRF=Cascade Range Footbills	NCo=North Coast	SNE=East of SN
CCo=Central Coast	NCoRI=Inner NCo Ranges	SNF=SN Footbills
ChI=Channel Islands	NCoRO=Outer NCo Ranges	SNH=High SN
CW=Central Western CA	NW=Northwestern CA	SnFrB=San Francisco Bay Area
D=Deserts	PR=Peninsular Ranges	SnGb=San Gabriel Mins
DMoj=Mojave Desert	SCo=South Coast	SW=Southwestern CA
DSon=Sonoran Desert	SCoRI=Inner SCo Ranges	Teh=Tehachapi Mtns
GB=Great Basin	SCoRO=Outer SCo Ranges	WTR=Western Transverse Ranges
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# The California Exopic Pest Plant Council

#### List B: Wildland Pest Plants of Lesser Invasiveness

Latin Name	Common Name	Habitats of Concern and Other Comments	Distribution <sup>2</sup>
Ageratina adenophora <sup>F</sup>	eupatory	Horticultural; coastal canyons, coastal scrub, slopes, Marin to San Diego Co; San Gabriel Mtns.	CCo,SnFrB.SCo,SCoRO
Bassia hyssopifolia	bassia	Alkaline habitats	CA (except NW,SNH)
Bellardia trixago	bellardia	Grasslands, on serpentine, where a threat to rare natives	NCoRO,CCo,SnFrB
Brassica nigra	black mustard	Coastal communities, esp. fog-belt grasslands; disturbed areas	CA-FP
Cardaria chalepensis <sup>B</sup>	lens-podded white-top	Wetlands of Central Valley	CA
Carduus pycnocephalus <sup>C</sup>	Italian thistle	Grasslands, shrublands, oak woodlands	sNCo,sNCoR,SNF,CW, SCo,ScV
Centaurea calcitrapa <sup>B</sup>	purple starthistle	Grasslands	NW,sCaRF,SNF,GV,CW,SW
Centaurea melitensis	tocalote, Malta starthistle	Widespread; sometimes misidentified as C. solstitialis; perhaps a more serious invader than currently recognized	CA-FP,D
Cirsium arvense <sup>B</sup>	Canada thistle	Especially troublesome in riparian areas	CA-FP
Cirsium vulgare	bull thistle	Riparian areas, marshes, meadows	CA-FP,GB
Conium maculatum	poison hemlock	Mainly disturbed areas but may invade wildlands; known to poison wildlife; early expanding stage in many areas, esp. San Diego Co. ripanan, oak understory	CA-FP
Crataegus monogyna	hawthom	Horticultural; recent invader, colonizing healthy native forest around Crystal Springs reservoir on S.F. peninsula	SnFrB,CCo,NCo,NCoR
Ehrharta erecta	veldt grass	Wetlands, moist wildlands; common in urban areas; potential to spread rapidly in coastal, riparian, grassland habitats	SnFrB,CCo,SCo
Erechtites glomerata, E. minima	Australian fireweed	Coastal woodlands, scrub, NW forests, esp. redwoods	NCo,NCoRO,CCo,SnFrB, SCoRO
Festuca arundinacea	tall fescue	Horticultural (turf grass); coastal scrub, grasslands in NCo, CCo	CA-FP
Hedera helix	English ivy	Horticultural, invasive in coastal forests, riparian areas	CA-FP
Holcus lanatus	velvet grass	Coastal grasslands, wetlands in No. CA	CA exc. DSon
Hypericum perforatum <sup>c</sup>	Klamathweed, St. John's wort	Redwood forests, meadows, woodlands; invasion may occur due to lag in control by established biocontrol agents	NW,CaRH,n&cSN,ScV, CCo,SnFrB,PR
Ilex aquifolium	English holly	Horticultural; coastal forests, riparian areas	NCoRO,SnFrB,CCo
Iris pseudacorus	yellow water iris, yellow flag	Horticultural; riparian; wetland areas, esp. San Diego, Los Angeles cos:	SnFrB,CCo,sSnJV,SCo
Leucanthemum vulgare	ox-eye daisy	Horticultural; invades grassland, coastal scrub	KR,NCoRO,n&cSNH, SnFrB,WTR,PR
Mesembryanthernum crystallinum	crystalline iceplant	Coastal bluffs, dunes, scrub, grasslands; concentrates salt in soil	NCo,CCo,SCo,ChI
Myriophyllum aquaticum	parrot's feather	Horticultural; streams, lakes, ponds	NCo,CaRF,CW,SCo
Olea europaea	colive	Horticultural and agricultural; reported as invasive in ripanan habitats in Santa Barbara, San Diego	NCoR,NCoRO,CCo, SnFrB,SCoRO,SCo
Phalaris aquatica	Harding grass	Coastal sites, esp. moist soils	NW,cSNF,CCo,SCo
Potamogeton crispus	curlyleaf pondweed	Scattered distribution in ponds, lakes, streams	NCoR,GV,CCo,SnFrB, SCo,ChI,SnGb,SnBr,DMoj
Ricinus communis	casior bean	SoCal coastal riparian habitats	GV.SCo.CCo
Robinia pseudoacacia	black locust	Horticultural: riparian areas, canyons; native to eastern U.S.	CA-FP.GB
Schinus molle	Peruvian pepper tree	Horticultural; invasive in riparian habitats in San Diego. Santa Cruz Is.	SNF.GV,CW,SW,Teh
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#### Exotic Pest Plants of Greatest Ecological Concern in California

#### List B: Continued

Latin Name	Common Name	Habitats of Concern and Other Comments	Distribution <sup>2</sup>
Schinus terebinthifolius	Brazilian pepper	Horticultural; riparian areas	sSCo
Senecio jacobaea <sup>8</sup>	tansy ragwort	Grasslands; biocontrol agents established	NCo,wKR,s&wCaR, nSNF, nScV,SW
Spartium junceum	Spanish broom	Coastal scrub, grassland, wetlands, oak woodland, 'NW forests, esp. redwoods; also roadcuts	NCoRO,ScV,SnFrB, SCoRO,SCo,sChI,WTR
Verbascum thapsus	woolly or common mullein	SNE meadows, sagebrush, pinyon-juniper woodlands; shores of Boggs Lake (Lake Co.)	CA
Vinca major	periwinkle	Horticultural; riparian, oak woodland, other coastal habitats	NCoRO,SnFrB, CCo, sSCoRO,SCo

# Red Alert: Species with potential to spread explosively; infestations currently restricted

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Latin Name	Common Name	Habitats of Concern and Other Comments	Distribution
Alhagi pseudalhagi <sup>A</sup>	camel thorn	Noxious weed of arid areas; most infestations in California have been eradicated	GV,sSNE,D
, . Arctotheca calendula <sup>A</sup>	Capeweed	Seed producing types are the problem; most are vegetative only	NCo;SnFrB,CCo
Centaurea maculosa <sup>a</sup>	spotted knapweed	Riparian, grassland, wet meadows, forest habitats; contact CA Food & Ag if new occurrences found	CaR,SN,nScV,nCW,MP, nSNE,sPR,NW
Crupina vulgaris <sup>F,A</sup>	bearded creeper, common crupina	Aggressively moving into wildlands, esp. grassland habitats	NCoR (Sonoma Co.),MP
Halogeton glomeratus <sup>A</sup>	halogeton	Noxious weed of Great Basin rangelands; report locations to CA Food & Ag; goal is exclusion from CA	GB .
Helichrysum petiolare	licorice plant	North coastal scrub; one population on Mt. Tamalpais, w. Marin Co.	Not in Jepson
Hydrilla verticillata <sup>fA</sup>	hydrilla	Noxious water weed; report locations to CA Food & Ag; eradication program in place; found in Clear Lake (Lake Co.) in 1994	NCoRI,n&cSNF,ScV,SCo.D
Lythrum salicaria <sup>8</sup>	purple loosestrife	Horticultural; noxious weed of wetlands, riparian areas	sNCo,NCoRO,nSNF,ScV, SnFrB,nwMP
Ononis alopecuroides <sup>Q</sup>	foxtail restharrow	Eradication efforts underway in San Luis Obispo Co.; to be looked for elsewhere in CA	CCo; not in Jepson
Retama monosperma	bridal broom	First noted at Fallbrook Naval Weapons Station, San Diego Co; could rival other invasive brooms	San Diego Co.; not in Jepson
Salvinia molesta <sup>F</sup>	giant waterfern	Ponds, lakes, reservoirs, canals	Napa, Sonoma cos., lower Colorado River; not in Jepson
Sapium sebiferum	Chinese tallow tree	Horticultural; riparian, wetland habitats, open areas and understory	ScV,SnFrB; not in Jepson
Sesbania punicea	scarlet wisteria tree	Horticultural; riparian areas; American River Parkway, Sacramento Co Suisun Marsh, San Joaquin River Parkway	ScV,SnJV; not in Jepson
Spartina anglica	cord grass	Scattered in S.F. Bay	Not in Jepson
Spartina densiflora	dense-flowered cord grass	Scattered in S.F. Bay, Humboidt Bay salt marshes	CCo.NCo
Spartina patens	salt-meadow cord grass	One site in S.F. Bay, also Siuslaw Estuary, OR and Puget Sound, WA	CCo

# The California Exonic Pest Plant Counsil

#### Need More Information

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Latin Name	Common Name	Habitats of Concern and Other Comments	Distribution <sup>2</sup>
Acacia dealbata	silver wattle	Aggressive in natural areas?	SnFRB,SCoRO,SCoRI,CCo
Àcacia decurrens	green wattle	Sometimes confused with A. dealbata; aggressive in natural areas?	Unknown
Acacia melanoxylon	blackwood acacia	Reported from S.F. Bay area, central coast, Santa Cruz Is.; spreads slowly; other areas?	SnFrB,SCoRO,SCo,CCo
Aeschynomene rudis <sup>8</sup>	rough jointvetch	Princeton area, Colusa Co.; pest of rice crops; potential threat to riparian, wetland habitats?	ScV
Agrostis avenacea	Pacific bentgrass	Invading vernal pools in San Diego area; attempts at manual eradication unsuccessful so far; problem in other areas?	sNCo,sNCoR,SNF, GV,CW,nSCo
Aptenia cordifolia	red apple	Habitats where invasive?	CCo,SCo,sChI
Asphodelus fistulosus	asphodel	Common in SCo highway rights-of-way, other disturbed sites; threats to wildlands?	sSnJV,SCo
Carduus acanthoides <sup>A</sup>	giant plumeless thistle	Threatens wildlands?	NCoRI,nSN,SnFrB; nSCoRO,MP
Cistus ladanifer	gum cistus	Horticultural; invades coastal sage scrub, chaparral; areas where problematic?	sCCo,SnGb
Cordyline australis	New Zealand cabbage	Infestation at Salt Point State Park; bird-dispersed; other problem areas?	Not in Jepson
Cotoneaster spp. (exc. C. pannosus, C. lacteus)	cotoneaster	Horticultural; bird-distributed; which species are problems in wildlands?	Unknown
Cupressus macrocarpa	Monterey cypress .	Native only to Monterey Peninsula; planted and naturalized CCo, NCo; threat to wildlands?	CCo
Descurainia sophia	flixweed, tansy mustard	Entering Mojave wildlands through washes; threat to wildlands?	CA .
Dimorphotheca sinuata	African daisy, Cape marigold	Horticultural; reported as invasive in w. Riverside Co., Ventura Co.; problem elsewhere?	SnJV,SCoRO,SCo,PR
Echium candicans, E. pininana	pride of Madeira, pride of Teneriffe	Horticultural; riparian, grassland, coastal scrub communities; spreads by seed	CCo,SnFrB,SCo,sNCo
Ehrharta longiflora	veldt grass	Reported from San Diego	Not in Jepson
Erica lusitanica	heath	Threat to wildlands?	NCo (Humboldt Co.)
Euphorbia lathyris	caper spurge, gopher plant	Invades coastal scrub, marshes, dunes; Sonoma, Marin cos.; threat to wildlands?	NCo,CCo,GV,SCo
Gazania linearis	gazania	Horticultural; invades grassland in S.F., coastal scrub?	CCo,SCo
Glyceria declinata		Although reported from Central Valley vernal pools, genetic research is needed to confirm identity, plants that have been called G. declinata key in Jepson to native G. occidentalis	Uncertain; not in Jepson
Hedera canariensis	Algerian ivy	Horticultural; invasive in riparian areas in SoCal?	Not in Jepson
Hirschfeldia incana	Mediterranean or short-pod mustard.	Increasing in western, southern Mojave; threat to wildlands?	NCo,SNF,GV,CW,SCo, DMoj
Hypericum canariense	Canary Island hypericum	Reported in San Diego area, coastal sage scrub, grassland; threat to wildlands?	SCo
Hypochaeris radicata	rough cat's-ear	Widespread in coastal grasslands, wetlands; threat to wildlands?	NW, CaRF, nSNF, ScV, CW, SCo
Isatis tinctoria <sup>3</sup>	dyers' woad	Well-known invader in Utah: threat to wildlands?	KR.CaR.nSNH.MP
Ligustrum lucidum	glossy privet	Horticultural: spreading rapidly on Mendocino coast: problem in other areas?	NCo: noi in Japson
Limonium ramosissimum ssp. provinciale	sea lavender	Reported spreading in Carpinteria Salt Marsh; problem in other areas?	Not in Jepson .

#### Exotic Pest Plants of Greatest Ecological Concern in California

# Need More Information: Continued

Latin Name	Common Name	Habitats of Concern and Other Comments	Distribution <sup>2</sup>
Ludwigia uruguayensis (= L. hexapetala)	water primrose	Invasive in aquatic habitats; non-native status questioned?	NCo,sNCoRO,CCo, SnFrB,SCo
Malephora crocea	ice plant	Invades margins of wetlands, bluffs along SCo	CCo,SCo,sChI
Maytenus boaria	mayten	Horticultural; scattered in riparian forests, ScV; east SnFrB	ScV,SnFrB
Mesembryanthemum nodiflorum	slender-leaved iceplant	Abundant on Channel Islands; invades wetlands; habitats where problematic?	SnFrB,SCo,ChI
Nicotiana glauca	tree tobacco	Disturbed places; not very competitive with natives in coastal scrub, chaparral; spreading along Putah Creek (Yolo Co.); problems elsewhere?	NCoRI,c&sSNF, GV,CW,SW,D
Oxalis pes-caprae	Bermuda buttercup	Invades disturbed sites; invasive in undisturbed habitats?	NCo,NCoRO,CCo, SnFrB,SCoRO,SCo
Parentucellia viscosa		Threat to NCo (Humboldt Co.) dune swales?	NCo,NCoRO,CCo,SCo
Passiflora caerulea		Horticultural; reported from SoCal; threat to wildlands?	SCo; not in Jepson
Pennisetum clandestinum <sup>F,C</sup>	Kikuyu grass	Disturbed sites, roadsides; threat to wildlands?	NCo,CCo,SnFrB,SCo, Santa Cruz Is.
Phyla nodiflora	mat lippia	Most varieties in CA are native; taxonomy unclear; status of plants in vernal pools, wetlands?	NW(except KR, NCoRH), GV, CCo, SnFrB, SCo, PR, DSon
Pinus radiata cultivars	Monterey pine	Cultivars invading native Monterey, Cambria forests, where spread of pine pitch canker is a concern	CCo
Piptatherum miliaceum	smilo grass	Aggressive in SoCal creeks, canyons, threats to wildlands?	NÇo,GV,CW,SCo
Pistacia chinensis	Chinese pistache	Horticultural; invades riparian areas and woodlands in ScV	ScV
Prunus cerasifera	cherry plum	Oak woodland, ripanan areas, esp. Marin, Sonoma cos.; bird-distributed; problems elsewhere?	SnFrB,CCo
Pyracantha angustifolia	pyracantha	Horticultural; spreads from seed in S.F. Bay area; bird-distributed; problem elsewhere?	sNCoRO,CCo,SnFrB, SCo
Salsola soda	glasswort	Threat to salt marshes?	nCCo,SnFrB
Salsola tragus <sup>c</sup>	Russian thistle, tumbleweed	Abundant in dry open areas in w. Mojave Desert, Great Basin; not limited to disturbed sites; threats?	CA
Salvia aethiopis <sup>8</sup>	Mediterranean sage	Creates monocultures in E. Oregon grasslands; threat to CA wildlands?	MP .
Stipa capensis		Distribution and threats?	Not in Jepson
Tamarix aphylla	athel	Spreading in Salton Sea area; threats to wildlands?	nSnJV,nSCo,D
Tanacetum vulgare	common tansy	Jepson reports as uncommon, escape from cultivation in urban areas; problem in wildlands?	NCo,NCoRO,CaRH, SCoRO
Verbena bonariensis, V. litoralis	tall vervain	Horticultural; invades riparian forests, wetlands; extensive along ScV riparian corridors; roadsides (Yuba Co.); elsewhere?	ScV,nSnJV,nSnFrB,CCo



## The California Decopie Pest Plant Council

#### Annual Grasses

Latin Name	Common Name	Habitats of Concern and Other Comments.	Distribution <sup>2</sup>
Aegilops triuncialis <sup>B</sup>	barbed goatgrass	Serpentine soils, grasslands	sNCoR,CaRF, n&cSNF, ScV,nCW
Avena barbata	slender wild oat	Lower elev. in SoCal; coastal slopes, coastal sage scrub, disturbed sites	CA-FP,MP,DMoj
Avena fatua	wild oat	Lower elev. in SoCal; coastal slopes, coastal sage scrub on deeper soil, disturbed sites	CA-FP,MP,DMoj
Brachypodium distachyon	false brome	Expanding in SoCal; common in Orange Co.	sNCoR,sCaRF, SNF,GV,CWSCo,sChI
Bromus diandrus	ripgut brome	Coastal dunes, coastal sage scrub, grasslands	CA
Lolium multiflorum	Italian ryegrass	Wetland areas, esp. vernal pools in San Diego Co.; common in disturbed sites	CA-FP
Schismus arabicus	Mediterranean grass	Threat to Mojave and Colorado desert shrublands?	SnJV,CW,sChI,D
Schismus barbatus	Mediterranean grașș	Threat to Mojave and Colorado desert shrublands?	SnJV,SW,D

## Considered, but not listed

	COLLOR	
Latin Name	Conimon Name	Habitats of Concern and Other Comments
Albizia lophantha	plume acacia	Not invasive
Anthoxanthum odoratum	sweet vernal grass	Disturbed sites on coast, Marin, Sonoma, Mendocino cos.
Carpobrotus chilensis	sea fig	Native status in question; not a threat to wildlands
Centranthus ruber	red valerian	Horticultural; roadcuts in Marin Co.; not a threat to wildlands
Convolvulus arvensis <sup>C</sup>	field bindweed	Disturbed sites; ag lands
Coprosma терепs	mirror plant	No evidence of wildland threat
Crocosmia x crocosmiiflora		Generally in disturbed coastal, urban areas, roadsides
Digitalis purpurea	foxglove	. Horticultural; scattered in prairies, meadows, disturbed sites; not a major wildland threat
Dipsacus sativus, D. fullonum	wild teasel, Fuller's teasel	Roadsides, disturbed sites
Fumaria officinalis, F. parviflora	fumitory	S.F. Bay area, Monterey Bay salt marshes, sandy disturbed sites
Medicago polymorpha	California bur clover	Grasslands, moist sites; mainly restricted to disturbed sites
Melilotus officinalis	. yellow sweet clover	Restricted to disturbed sites in CA
Nerium oleander	oleander	Horticultural; not invasive, although reported from riparian areas in Central Valley, San Bernardino Mtns.
Picris echioides	, bristly ox-tongue	Disturbed areas
Silybum marianum	milk thistle	Disturbed areas, especially overgrazed moist pasturelands; may interfere with restoration
Xanthium spinosum	spiny cocklebur	Identified as native in The Jepson Manual (Hickman, 1993) and A California Flora (Munz and Keck, 1968): restricted to disturbed areas
Zantedeschia aethiopica	calla lily	Horticultural; mainly a gardan escape in wet coastal areas
Zoyšia cultivars	Amazoy and others	Horticultural; no evidence of wildland threat

# APPENDIX F WATER LETTER



... Pedicated to Community Service

2554 SWEETWATER SPRINGS BOULEVARD, SPRING VALLEY, CALIFORNIA 9:978-2004
TELEPHONE: 970-2222, AREA CODE 619 www.oraywatar.gov

December 15, 2006

W.O. P1438-0030000 Activity: 3104

PBS&J 9275 Sky Park Court, Suite 200 San Diego, CA 92123

SUBJECT: Fire flow calculations for Otay Crossings.

To Ms. Jennifer Bileck,

Fire flow calculations for the subject site were performed by District staff using MWH Soft, Inc., H<sub>2</sub>O map water, Version 6.0, under the following assumptions:

- a. The water level in the storage facility at the time of a fire is at the minimum operational level that typically occurs during peak-hour demand conditions.
- b. The prescribed two-hour fire duration coincides with a maximum day demand condition.
- c. Into and out of the pressure zone where a fire is occurring, all Agency booster pumps are off.
- d. Areas outside the fire circumference in the same pressure zone maintain a minimum pressure of 20 PSI.
- e. Current static pressure based on hydraulic grade line calculations is: 131.6 PSI

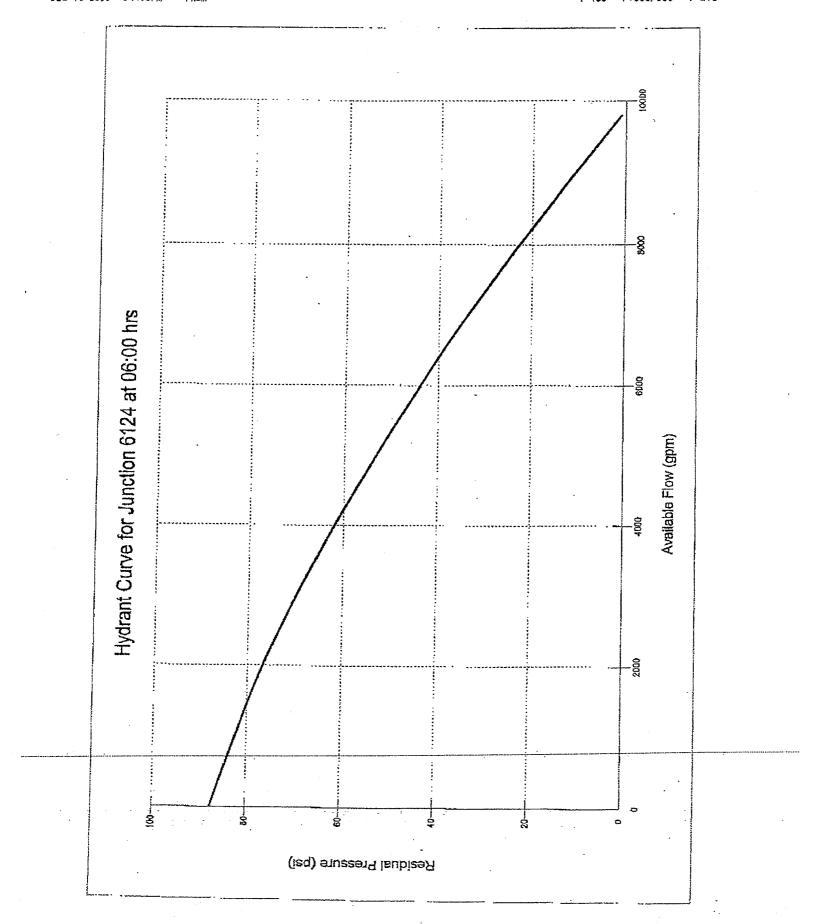
#### The results are as follows:

STATIC PRESSURE:	86.7	PSI (System demand only at
RESIDUAL PRESSURE:	64.3	maximum day condition) PSI (System and fire flow demand of
FLOW @ 40 PSI: FLOW @ 20 PSI:	6,354 8,177	2,500 gallons per minute) GPM GPM

A hydrant system curve is also attached for your reference.

Sincerely,

THE OTAY WATER DISTRICT DEVELOPMENT SERVICES



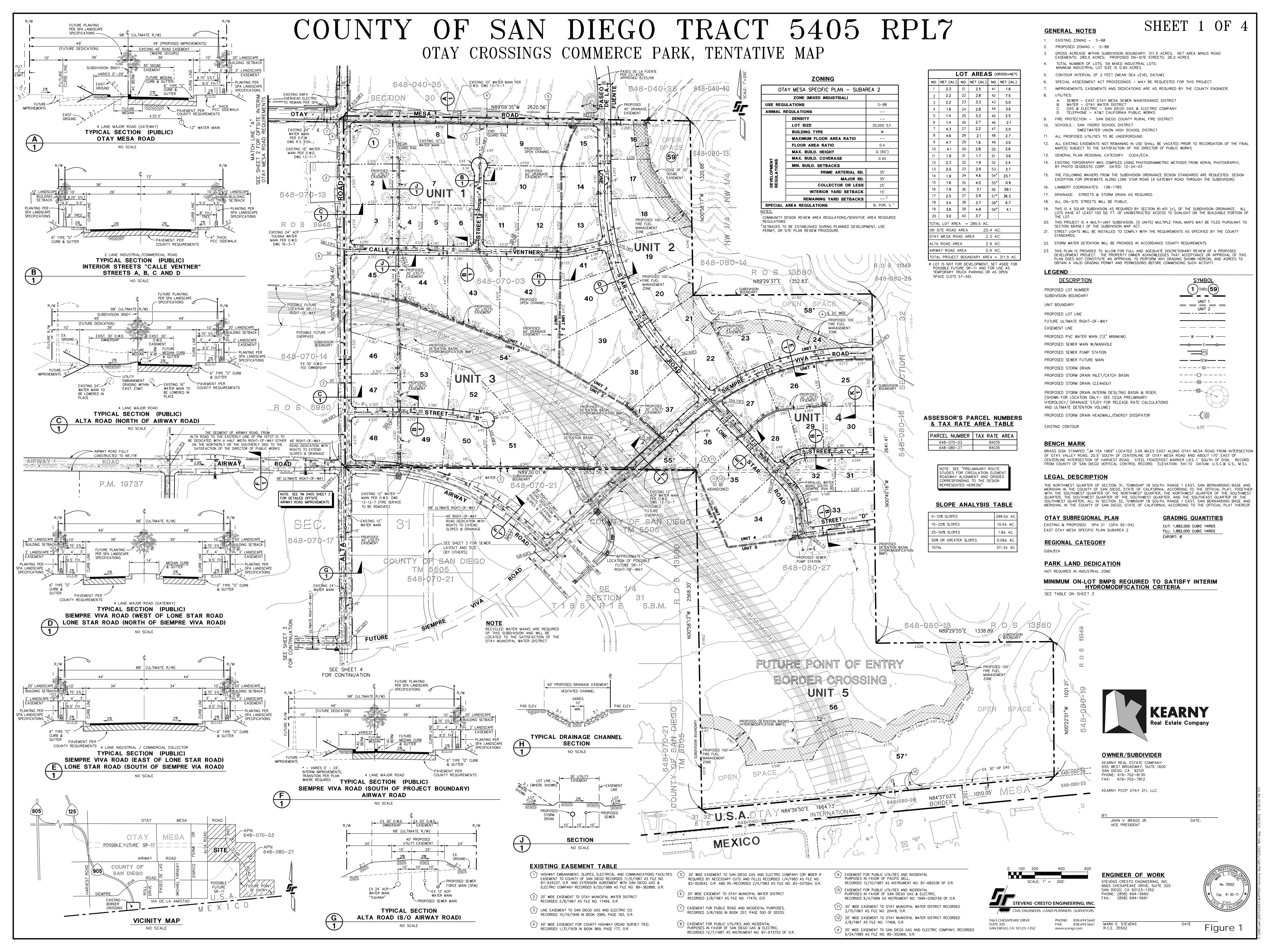
#### APPENDIX G

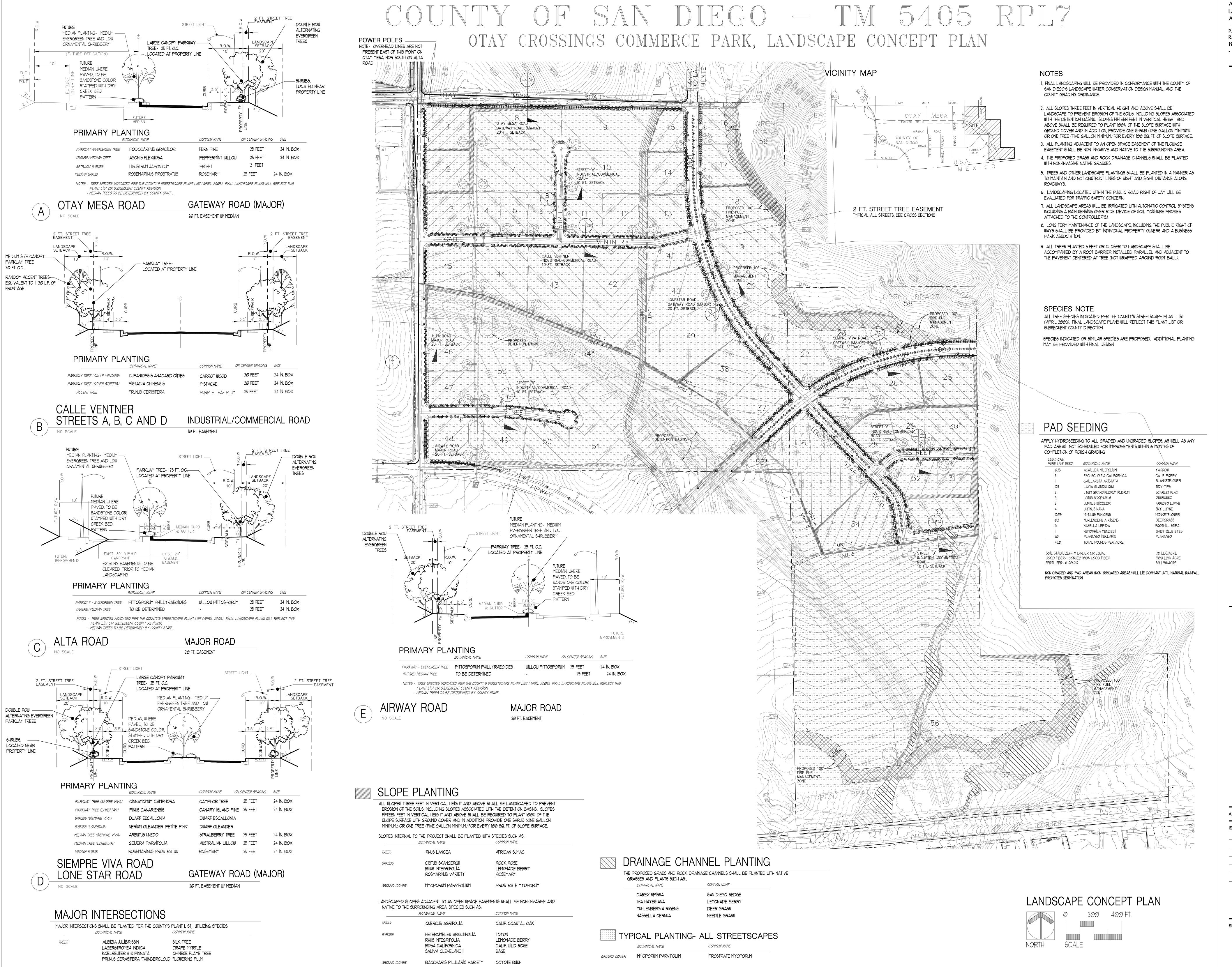
FIRE DISTRICT LETTER



ODUNTY OF SAN DIEGO DEPT, OF PLANNING 2 LAND USE \$201 RUFFIN ROAD, SUITE 0 SAN DIEGO, CA \$2122-1688 (080) 866-6981 (886) 207-8770

PROJECT FACILITY AVAILABILITY F	·ORM	rina
Please type or use pen		定
KEARNY PCCP OTAY 311, LLC 858-847-9322	ORG	I.
Owner's Numa Phone	ACCT	
400 SOUTH SIERRA AVE., SUITE 100	ACT	
	TASK	rr e
SOLANA BEACH CA 92075	DATE	AT \$
City State Zip	DISTRICT CASHIER'S USE	
SECTION 1. PROJECT DESCRIPTION	TO BE COMPLETED	Y APPLICANT
	Ascessore Parcel Number	er(s)
A, Mejor Subdivision (TM) Specific Plan or Specific Plan Amendment Miner Subdivision (TPM) Certificate of Compliance	(Add axira il nacessory)	
Boundary Adjustment	6 4 8 0 7 0	0 3
Boundary Adjustment Rezone (Raciassification) front Major Use Permit (MUP), purpose: Time ExtensionCase No. Expired MapCase No.	6 4 8 0 8 0	2 7
Time ExtensionCase No.		
Oltar		
B. Residential Yolal number of dwelling units  Gpmmarolal Gross floor area  Industrial Gross floor area	Thomas Bros. Page 1334 Gri	d C-2&D-2
Industrial Indiaphric store and second	SW Corner Otay Mesa & Alte	KORO
C. Total Project screege 311 Yolai lots 50 Smallest proposed to 0.0 Ac	Broked pridoese 5(6)	e4
C. Total Project acreage 311 Total total	EAST OTAY MESA	92164
	Community Planning Areassubsection	¥Њ
OWNER/APPLICANT ACRESS TO COMPLETE ALL CONDITIONS REQUIRED BY	THE DISTRICT,	
And and Simulation	Date: 5 10 10	
Addines: 400 S Slerra Ave, #100, Solana Beach, Ca 92075	Phone: 858-847-9322	
Addines: 400 S Signa Ave, #100, Solana Beach, Ca 92075 (On completion of above, present to the district that provides fire	e proteoliop to complete Sention 2 and 3 bel	ow.)
SECTION 2: FACILITY AVAILABILITY	TO BE COMPLETED BY DISTRIC	
Addings: On completion of above, present to the illetrict that provides the SECTION 2: FACILITY AVAILABILITY  District name Sett Organization that will append the propose	Fection District	116.01
Indicate the location and distance of the primary fire station that will serve the propose	nd project: STA 22 770	ANAKA
A. XI Project is in the District and eligible for service.	dans owner must apply for annexation.	
A. A Project is in the District and eligible for earlice.  Project is not in the District but is within its Sphere of influence bound Project is not in the District and not within its Sphere of influence bound Project is not joseful entirely within the District and a potential bound project is not joseful within the District and participation and plants.	undary.	District.
Project is not joséted entirely within the District and a potential bound B. Essed on the capacity and capability of the District's existing and pla adequate or will be adequate to serve the proposed project. The expension	dary issue exists with the	currently
B. (M. Hased on the capacity and cupming of the proposed project The Ave	pactor amargency travel time to the propo	paed project is
minutes.	a proposed development within the next f	īve yparo,
Adequate or will be adequate to salve the projection facilities are not expected to be adequate to serve the C. District conditions are alloched. Number of sheets attached:	a proposed det dialities	
Diatuci will enbuil conditions at a later detail		
SECTION 3. FUELBREAK REQUIREMENTS  Note: The fuelbreak requirements prescribed by the fire district clearing prior to project approval by the Depart.	ct for the proposed project do not suth	orize any
clearing prior to project approval by the Depart	ment of Planning and Lund Use.	
to within the represent grained 1017 feet of clearing Will be	required around all structures.	
Within the proposed project	of additional fuelbreak requirements may	apply. menis will not
The proposed project is located in a hazardous wildishe into size see, an Environmental mitigation requirements should be coordinated with the pose fire hazards.	is the distinct to elimina martined ideas.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	sales to the poolination for the proposed DIO	eol ar until it is
This Project Facility Availability Poim is valid until final discretionary action is taken put withdrawn, unless a shorter articulon data is otherwise noted.	tanata ta tise abbirontinti tat tra bisdindan bish	
David Nissan	FC. 619-669-1184 S	112/10
	Date Onle	··· · · · · · · · · · · · · · · · · ·
On completion of Scotles 2 and 3 by the District, applicant	in to automit this form with application in:	
Zoning Counter, Department of Planning and Land Use, 6201 i	le to submit this form with application to: Rying Road, Suite B. Sen Diago, CA 92123	
Zoning Counter, Department of Planning and Land Use, 6201 (	is to submit this form with application to: Ruffin Road, Suite B, Asn Diago, CA 92129	





AHLES
LANDSCAPE
ARCHITECTURE INC.

P.O. Box 1503
Rancho Santa Fe, California 92067

858.756.8963

TM 5405 RPL6

LANDSCAPE CONCEPT PLAN

OTAY CROSSINGS COMMERCE PARK

Kearny PCCP Otay 311, LLC.

SAN DIEGO COUNTY, CALIFORNIA

ALA PROJECT NO:	0628
SSUE:	DATE:
	II MAY 10

SHEET: